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Bridging the skills gap and the rise of the short-term certificate: A case study of a short-term manufacturing certificate at a mid-size comprehensive community college

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**Bridging the skills gap and the rise of the short-term certificate: A case study of
a short-term manufacturing certificate at a mid-size comprehensive community college**

by

Valentina Ahedo

A thesis submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

Major: Political Science

Program of Study Committee:
Alexander Tuckness, Major Professor
Kelly B. Shaw
Larry Ebbers

Iowa State University

Ames, Iowa

2016

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DEDICATION

This work is dedicated to the many people who supported and encouraged me in completion of this degree. In particular, I am grateful for the love and support of my family: Kevin Hutchison, my dear husband, who over the last year has seen me at my best *and* my worst; our children, Ana, Ariel, Connor and Aidan; my sister and brother-in-law, Lupe and Craig, whose support is always timely and generous; my siblings; and, my mother, Mrs. María Soledad Martinez, who as an immigrant to this country wanted nothing more than to ensure the well-being and education of her children. Her unwavering commitment and sacrifice for us and to our education is an incredible inspiration to me and I strive to operate out of respect for that commitment in the work that I do.

She was a woman of great love, faith, integrity, and courage and to her I will always be indebted: *Eternal rest grant unto her, O Lord. Let the Perpetual Light shine upon her. And may the souls of all the faithful departed, through the mercy of God, rest in peace. Amen.*

Lastly, I am thankful to my triune God for never having abandoned me throughout this incredible journey...and having faith that He always has better plans in store for me than those I have for myself. St. Thomas Aquinas pray for us.

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NOMENCLATURE

ABE	Adult Basic Education
CC	Community College
CTE	Career and Technical Education
ELL	English Language Learners
ESL	English as a Second Language
IHE	Institution of Higher Education
L-T	Long-term (typically 1 year or longer)
S-T	Short-term (typically less than one year)
PAT	Principal Agent Theory
PBF 1.0	Performance Based Funding first iterations (in late 1970s, 80s)
PBF 2.0	Performance Based Funding second iterations (2000s)
SOC	Standard Occupational Classification System used by federal agencies to classify workers into occupational categories
WIOA	Workforce Innovation and Opportunity Act (passed in 2014), replaces WIA
WTCS	Wisconsin Technical College System, administrative office system for the sixteen technical colleges in Wisconsin

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ABSTRACT

The recent resurgence of Performance Based Funding (PBF) in higher education has called for increased accountability to taxpayers for institutions receiving public State funds. The increase of short-term credentials/certificates has been cited as a by-product of the accountability movement that started in the late 1970s and is now known as PBF 2.0.

Recently a Midwest state adopted PBF for its technical college system. With end results mainly focused on completion, employment, and meeting industry's needs for skilled workers, there has been an interest in understanding how PBF is shaping public Institutions of Higher Education's response to this call for accountability. While there have been several general state-level observation studies conducted on this question, and success results have been mixed, there have been few institution-level studies conducted on how individual institutions are responding to PBF.

These general findings indicate nationwide that IHE's are finding ways to address accountability measures. In particular, there has been an increase in the number short-term certificates, especially those that have been developed to bridge students from remedial/basic/ESL education to credit- or program-based learning. This study examines this trend and investigates how a mid-size comprehensive community college is responding to these new accountability measures through the use of short-term certificates bridging basic and credit-based education. Seeking to learn more about the motivation on part of students, faculty and administrators to participate in such programming, each of these groups is surveyed and results analyzed around the offering of a short-term bridge certificate program in manufacturing.

CHAPTER I

INTRODUCTION AND RESEARCH QUESTION

A Sound Bite is Powerful

The face of higher education is changing. It was not too long ago that the U.S. was the world leader in educational attainment. Economic realities have largely affected the way most of this country now experiences education – at all levels and especially at the post-secondary level. The headlines are telling, confusing, and loud: student debt is now the second largest debt held by households (after mortgages and now displacing credit card debt for second place).¹ Tuition costs are out of reach for many families who turn to loans to “mortgage” a degree. Businesses cannot find skilled workers to fill jobs. Graduation rates are abysmal, especially at for-profit schools, some four-year schools, and nearly all community colleges. Graduates cannot find jobs because they, too, don’t have the right skills. In fact, the question of whether a college degree is even worth pursuing – especially those produced by predominantly liberal arts colleges – is gaining traction.

Policy makers are not immune to these seemingly urgent messages presented by the media and so have worked to find solutions for what is believed to be educational system shortcomings...shortcomings that political leaders, economists, and businesses claim threaten the

¹ Denhart, Chris. “*How the \$1.2 Trillion College Debt Crisis is Crippling Students, Parents and the Economy.*” Forbes Magazine. 07 August 2013. Web. forbes.com

very core of this country's economic future if we don't force a change to how things have historically been done. The National Conference of State Legislatures proclaimed in their "*Transforming Higher Education National Imperative — State Responsibility*" 2006 report that:

“The crisis in American education is significant to the nation's future. States and the federal government have neglected their responsibilities to ensure a high-quality college education for all citizens. As a result, U.S. citizens are not achieving their full potential, state economies are suffering, and the United States is less competitive in the global economy.”

And the 2006 Spellings Commission Report, drafted by a diverse team of top U.S. business and education leaders, observes that “American higher education has become what, in the business world, would be called a mature enterprise: increasingly risk averse, at times self-satisfied, and unduly expensive” (xii).

It is easy to focus on the sound bites and believe that if only educators at all levels would be more responsive, all would be well again. However, as is often the case in the “real world,” the issues are not as simplistic or as isolated as the headlines would have one believe.

This paper will examine how the call for greater accountability from a dominant sector of the American economy has led the charge to re-define and re-shape the world of public higher education, especially at the community and technical college level, the schools that are often tasked with being the workforce development engine of their respective communities and who often are open doors to older, less well-prepared, and minority students.

This first chapter of this work, then, provides the background information on the conditions that fostered the rise of the short-term certificate. Some of this background work was

explored by the author in a 2015 paper entitled “*Creating Compelling Stories in the Polis: Higher Education Funding and the Student Loan Debt Crisis.*”² That work set the stage for the further exploration of why community and technical colleges especially would most likely have the capacity to serve students in short-term (less than one year) offerings. But first, a short review of the conditions that cultivated and promoted the state of today.

The Rise of the Great Middle

The inextricable linking of educational attainment with economic viability really is a modern phenomenon. With roots in the early 1900’s American innovations such as the land grant university system, the rise of public secondary education (high school), and perhaps most importantly of all, the G.I. Bill which provided a free college education to veterans, coalesced with and fueled the post-war economic boom. These investments in human capital set the stage for unparalleled economic growth in this country.³ Over a relative short period of time, education and economic growth, gave rise to technicians, managers, and white-collar workers.⁴ The benefits from an educated workforce were so outstanding that the link between education and economic growth was made, prompting James McAndrews of the Federal Reserve Bank of New York to comment in his 2015 *Remarks at the National Association of College and*

² Ahedo, Valentina. “Creating Compelling Stories in the Polis: Higher Education Funding and the Student Loan Debt Crisis.” 2015. TS.

³ Hunt, James B. and Thomas Tierney. “American Higher Education: How Does It Measure Up for the 21st Century?” *The National Center for Public Policy and Higher Education Report #06-2*. [highereducation.org. Web. 10 October 2015](http://highereducation.org/Web.10October2015).

⁴ Goldin, Claudia. “America's graduation from high school: The evolution and spread of secondary schooling in the twentieth century.” *Journal of Economic History*: 58(2) (1998): 345-374. Web. Accessed 23 January 2016.

University Business Officers on the return of financing higher education as a public good, that “...(E)vidence strongly supports the view that a college degree, while expensive, is a worthwhile investment not only for the individual ... but also for society as a whole.”⁵

The Hollowing Out of the Great Middle Begins

By the late 1970’s, the economic situation certainly in the United States and in some key places around the world, changed. The postwar era saw the world flooded with U.S. products and U.S. dollars. Eventually parts of the world recovered from the wars’ devastation – thanks in part to the rebuilding efforts of the United States through the Marshall Plan. Goods from Japan and Europe began to compete with American products, lessening the need for American dollars. American producers, now “mature enterprises” lost in innovation and their products were no longer the preferred option for consumers. Inflation increased as prices rose to offset sales lost abroad. As less products were sold, less were made, prices kept increasing, and unemployment rose. Soon, the federal government was undertaking attempts to keep inflation in check and the American economy afloat. But pressure was so great from the rest of the world that the U.S. finally saw no other option than to end the gold standard of dollar valuation.⁶ After several years and in concert with larger economies (members of the collapsed Bretton Woods System), the exchange system was allowed to float. But it was not enough to save the U.S. economy; U.S.

⁵ McAndrews, James. “Student Debt and Higher Education Financing: A Public Finance Perspective.” National Association of College and University Business Officers. The Waldorf Astoria, New York City. 05 February 2015. Web. 01 December 2015.

⁶ Kollen Ghizoni, Sandra. “Nixon Ends Convertibility of US Dollars to Gold and Announces Wage/Price Controls.” Federal Reserve Bank of Atlanta. August 1971. federalreservehistory.org/Events/DetailView/33 accessed 06 August 2015.

dollars were no longer the preferred currency, and unemployment and inflation continued to increase, leading to *stagflation*.

It was this seemingly unending time of stagflation that eventually led to the tax payer revolt, which began in California in 1978 with the passage of Proposition 13 and subsequently swept across the country. By 1981, sixteen other states had voted to limit tax levies, reduce budget growth and slow the rate of tax increases.⁷ Legislature after legislature was forced to cut taxes and revenue streams dried up. Ronald Reagan was voted into office on a platform of cutting spending and taxes, decreasing the size of government, and increasing accountability.

Under his presidency, the United States entered into the deepest depression since the Great Depression and unemployment levels were historically high, especially in the Rust Belt states where entire cities and regions of the Midwest and Northeast were decimated by the loss of union manufacturing jobs, although major cities in the South, California and Texas were also greatly affected. These cities and regions suffered a significant loss in household income and men were disproportionately affected. For those areas who were not able to transform their economies (some were, such as Charlotte, NC, and most recently, Cedar Rapids, IA), a hollowing out occurred whereby its middle class (educated professionals) chased opportunity⁸, leaving large scale poverty and low educational attainment rates behind.

⁷ "Proposition 13 Paved Way for Tax Revolts Across U.S." *LATimes*. articles.latimes.com. 14 February 1988. Accessed 01 December 2015.

⁸ See various articles and reports on the issue:

Gazzar, Brenda. "Revisiting the Watts Riots 50 Years Later: 'The Explosion was Almost Predictable.'" *Los Angeles Daily News*. 08 August 2015. dailynews.com/general-news/20150808/revisiting-the-watts-riots-50-years-later-the-explosion-was-almost-predictable. Accessed 10 August 2016.

Atkins, Patricia, et al. "Responding to Manufacturing Job Loss: What Can Economic Development Policy Do?" *Metropolitan Policy Program at The Brookings Institution*. June 2011. brookings.edu/wp-content/uploads/2016/06/06_manufacturing_job_loss.pdf. Accessed 10 August 2016.

Postsecondary Public Education: Still a Public Good?

As alluded to earlier, there was a time when the high school diploma was an unprecedented investment in human capital. It provided enough training to get a good job and support a family given the production methods of the time and with little competition from the rest of the world.

This transformation occurred in relative short order and its impact was profound. In 1920, a median 18 year old had a 15 % chance of being a high school graduate. By 1938, the median 18 year old *was* a high school graduate. This change allowed the United States to pull far ahead of its peers in terms of education and income. High school completion was especially important to females who were then qualified to take office instead of manufacturing jobs, which often paid females the least. This level of investment was sufficient to help fuel thirty years of unparalleled economic growth and laid the foundation for reaping the benefits of the G.I. Bill after W.W.II.

When the economy was strong, states were funding public higher education at very generous levels. In 1968 Wisconsin, the University System received nearly $\frac{3}{4}$ of its budget from the State. [Community and technical colleges, while they educate the largest number and neediest of students, typically receive less state support and more local support via levies (on average, 17% of state support vs 40% levy support, respectively).⁹] This funding strategy allowed Wisconsin, like many other states at that time, to be a low-tuition, low-financial aid

Engel, Emily, and Susan Longworth. "Industrial Cities Initiative Working Paper Summary." *Federal Reserve Bank of Chicago. Community Development and Policy Studies Division*. August 2012. Accessed 10 August 2016.

⁹ "Financing Two-Year Institutions of Public Higher Education in Wisconsin." Wisconsin Coordinating Council for Higher Education, Madison. Report No.- WCCHE-113, September 1968. Web. 04 January 2016. p22.

state. In fact, in some states, tuition was free (e.g., select California and New York schools). The general public demonstrated their investment, through one mechanism or another, in public higher education.

The taxpayer revolt substantially changed this investment. The “Great Slow-Down” reduced federal spending and affected state coffers. With reduced state tax levies, legislatures and governors had to make tough choices and higher education became known as the “balance wheel” that could absorb funding cuts to allow new and more immediate demands to be served with scarcer dollars.¹⁰ New and growing demands on state dollars included Medicaid, larger k-12 populations, federal lawsuit compliance costs, and corrections. On average, state spending on public higher education was reduced to providing 30-40% of costs.¹¹ For Wisconsin, the 2014-2015 State appropriation was approximately 19% of its overall budget.

Colleges and universities made up funding losses by increasing college tuition. McAndrews in his same 2015 speech indicates that “since 2007, those states with the largest funding cuts also had the highest tuition increases.” Increasing tuition rates to meet funding gaps has outstripped the cost of inflation and affordability, especially for lower and middle income families, whose wages have remained remarkably flat over the last 40 years (save the cost of health care benefits). In Wisconsin, students and their families now cover nearly 70% of college-going costs.¹² Most families are turning to loans to finance the cost of earning a college degree.

¹⁰ Gosling, James J. *Budgetary Politics in American Government*. New York: Routledge, 2009. Print.

¹¹ Rabovsky, Thomas M. “Accountability in Higher Education: Exploring Impacts on State Budgets and Institutional Spending Patterns.” *Journal of Public Administration and Research and Theory, Inc.* Vol 22 (2012): 675-700. Google Scholar. Web. 09 October 2015.

¹² UW System 2014-2015 *Factbook*. wisconsin.edu/download/publications(2)/Fact-Book.pdf, page 40.

Accelerating the use of loans to meet college costs is the decline in the purchasing power of the Pell grant and the increase in the number of students going to college, declining from covering more than 75% of 4-year public college costs in the early 1970's to today's covering of barely 30% of these same costs. At community colleges, the Pell previously paid nearly all costs of attendance to now only covering about 60% of those costs.¹³

Moreover, student loans have been adopted as a normal – and expected - vehicle by which to finance an education: in 2004 only 27% of 25 year olds had student debt; in 2013, 45% of the same demographic have loans (McAndrews 3). Not only are more students and families taking on debt, but the amount of debt they are taking on has also significantly increased. And, as students put off paying for their loans due to un- or under-employment, interest keeps growing, and the true cost of the loan grows accordingly. Combined, all these factors have resulted in the shifting of higher education from the realm of a public good to a private good, even as policy makers stress the importance of an educated workforce to the economic health of the country.

Increased Accountability for Public Higher Education

Social, political, and economic pressures dealt a significant blow to post-war time prosperity in the United States resulting in an urgency to create a more responsive, efficient, and relevant higher education system that could, in F. King Alexander's words, "play a pivotal role in transforming the existing low-wage economic structures into high-performing, technology-

¹³ Goldrick-Rab, Sara and Nancy Kendall. *"Redefining College Affordability: Securing America's Future with a Free Two Year College Option."* The Education Optimists. April 2014. Web. 18 September 2015.

based economies.”¹⁴ Donald Kettl in his 2005 book *The Global Public Management Revolution* asserts that this desire for reform, in all areas of government and public services, was universal. Around the world, there was a notion that the government which had ushered in the industrial revolution would not be the same government that could effectively respond to the punishing demands of the information age or a knowledge-based economy. Reform would lead countries into economic prosperity and social stability¹⁵; it would take a major re-conceptualizing of the role and function of government, focusing on outputs or results, that would be the means by which the U.S. would re-gain its economic success. Ensuring that students “emerge from college with a degree that adequately prepares them for the challenges of the modern economy,”¹⁶ gave birth to what has been termed Performance Based Funding (PBF). Over the last thirty years, as states have tried to ensure its public IHEs are meeting the demands for a new world of work, this model of funding has moved through two distinct iterations - from PBF 1.0 to PBF 2.0.

It is against this backdrop that this inquiry on the rise of the short-term certificate takes place. If indeed the means to shared prosperity and social stability is to ensure adequate preparation for the challenges of the modern economy, is a less-than-one-year certificate sufficient to help make this case?

¹⁴ Alexander, F. King. “The Changing Face of Accountability: Monitoring and Assessing Institutional Performance in Higher Education.” *The Journal of Higher Education*, Vol/ 71, No. 4 (July-August 2000): 411-431. JSTOR. Web. 24 November 2015. Page 412

¹⁵ Kettl, Donald F. *The Global Public Management Revolution*. Washington, D.C. Brookings Institution Press, 2005. Print. Page 6.

¹⁶ Rabovsky, Thomas M. “Accountability in Higher Education: Exploring Impacts on State Budgets and Institutional Spending Patterns.” *Journal of Public Administration and Research and Theory, Inc.* Vol 22 (2012): 675-700. Google Scholar. Web. 09 October 2015. Page 697.

Research Question

A shared interest in nearly all the states adopting PBF policies has been increasing the rate of credential completion. There has also been an urgent call for a skilled workforce to meet the needs of today's jobs. In particular, the manufacturing industry indicates that alleviating the current workforce "skills gap" is needed to ensure its global competitiveness and have appropriate production levels to meet customer demands. At all levels of education, and particularly at the two-year college level, there has been an effort to increase completion rates to meet the needs of their stakeholder industry sectors. While early for definitive results, most of the literature to-date indicates that PBF policies have not been successful in raising completion rates for longer-term degrees. Rather, there has been a noted increase in the rate of short-term certificate completion among states under PBF policies. What compels institutions to concentrate resources at this level of completion? What are the outcomes for their students and industry partners?

The purpose of this case study is to examine the experience of a mid-sized comprehensive community college in offering a short-term manufacturing essentials certificate bridge program and compare it to national trends. The short-term certificate is an entry-level certificate meant to provide participants with an overview of the manufacturing industry, basic safety education and certification, and a working knowledge of production methods.

The certificate was developed under the auspices of the Trade Adjustment Assistance Community College and Career Training (TAACCCT) Grant Program, which was enacted as part of the 2009 the American Recovery and Reinvestment Act. In 2010, the Obama administration designated \$2 billion over four years to fund the TAACCCT program, which was

to provide “community colleges and other eligible institutions of higher education with funds to expand and improve their ability to deliver education and career training programs that can be completed in two years or less, are suited for workers who are eligible for training under the TAA for Workers program, and prepare program participants for employment in high-wage, high-skill occupations.” Targeting adults, the Department of Labor’s interest was to help this population acquire the skills and credentials necessary to obtain high-wage, high-skill employment while also meeting the needs of employers for skilled workers. In 2012, a consortium of Wisconsin’s technical colleges were awarded nearly \$15 million to fund the “Making the Future: The Wisconsin Strategy” designed to address the need for skilled workers in advanced manufacturing.

Nationally, certificates targeting adults in developmental education are a vehicle by which to meet PBF outcomes, address the skills gap, stay ahead of demographic shifts, and address economic inequality prevalent among “at-risk” populations (the poor and minorities) in the college’s jurisdiction. Has that borne out in this particular case? What have been some of the challenges and opportunities for this particular comprehensive community college?

The study will examine the success of the short-term certificate from multiple perspectives and experiences including administrators, students, and faculty and staff to gain a fuller understanding of how the college has attempted to meet the varying needs of its stakeholders. Industry or business perspectives will also be examined through previous work conducted by the college.

In particular, the research questions that illustrate the efficacy of the certificate include:

Students

1. What types of academic benefits did students realize from completion of the certificate?
2. What types of employment benefits did students realize from completion of the certificate?
3. Do students have a better awareness of potential career trajectories on the manufacturing career pathway?
4. What types of academic and non-academic barriers did students encounter along the way?
5. What types of wrap-around services facilitated their learning, completion and continuation?
6. How, if at all, did students demonstrate engagement with the college?

Faculty and Staff

1. How well have CTE and general/developmental education instructors and staff been able to engage and cooperate in this cross-boundary, silo-busting work?
1. What training, supports, or services for themselves did they find critical to engage in bridge programming?
2. What supports or services for students did they find critical to allowing students to successfully complete the CTE coursework?

Administrators

1. What challenges or opportunities do college leaders see with the general direction of career pathways, career pathways and the completion agenda?

2. How does performance based funding guide their work?
3. How would administrators be able to sustain these types of offerings beyond grant opportunities?
4. Were administrators aware of businesses' needs and able to meet them generally and with this certificate, in particular?
5. How difficult was it to collaborate across disciplines and college systems that categorize and treat developmental and credit-based programming differently?

Within the last two years, the College has conducted several surveys with businesses.

Two will inform this study. One targeted manufacturers and the certificate. The other, regarding academic planning, had been sent to all business stakeholders and partners and was specifically seeking to understand the skills gap. Questions from these include:

Manufacturers

1. Would they hire graduates of the certificate?
2. Did the training meet their needs for entry-level workers?

All Businesses:

3. Generally, what are the missing skills impacting your business?

Chapters two (literature review) and three (methodology) provide the foundation and basis for how this inquiry is defined and developed.

CHAPTER 2

LITERATURE REVIEW

The scope of the literature review conducted for this study is broad. The reason for the wider lens is due to the complexity of the issue under examination. It would be unhelpful to unhinge the issue from the larger set of events that have shaped how we currently experience public higher education. This review will provide the basis from which to understand the rationale for and results of the surveys that were administered as part of this study.

The review will focus on the following areas: review of the theoretical framework from which this topic will be examined, Principal-Agent Theory or PAT and how this predicts behavior of both principals and agents in pursuit of respective goals; the reduction in public funding of higher education and how the response of IHEs has led to the some to charge that they have come to operate more like a free market; the evolution of performance-based funding (PBF) as an accountability mechanism, and the large scale survey results that have been conducted to-date on its effectiveness; the manufacturing experience around skills shortages and how this sector has driven the charge for re-imagining education; the review of career pathways work, the “promised land” of degree completion; an overview of community college characteristics and how this may help or hinder credential completion; and lastly, a brief review of the literature around diversity and poverty in Wisconsin.

A Theoretical Grounding

If the study of higher education is a relatively recent phenomena, then the tools to explain governance and relationships between institutions of higher education and the government are even more elusive. Michael Bastedo (*Manifesto*, 2012) provides an overview of the lack of theory, generally in the study of higher education and lays out his argument for a need to re-orient organizational theorists to study the work of higher education as it relates to faculty, staff, students and the pressing contemporary issues of today including questions related to equity, access and social justice (*Manifesto*, 5). The work of Jason Lane (2012) and Jussi Kivisto (2010) provide a theoretical framework through Principal-Agent Theory (PAT) for understanding government and higher education relations.

Higher education as a field of study is relatively new

It is imperative, Bastedo argues, that today's higher education organizational theorists should be the ones to engage in this work as they are more inclined and motivated to operate from a "nuanced understanding and depth of concern" for higher education as a profession that scholars in other disciplines do not share (or "pure theorists" as he calls them, acknowledging and even advocating, that organizational theory in higher education is and should be adapted from other disciplines) [*Manifesto*, 9].

Focusing on the *work* of higher education could stand to make a significant contribution to understanding the pressing issues that higher education faces today: how do we gain an understanding of what happens inside a college classroom, how do we measure the learning, or lack of it, to better account for this work? This is an important question given that technical

college instructors are, by and large, experts in their occupation and university professors are rarely taught *how* to teach. A re-focusing on the internal work could help answer salient and pressing questions related to access, success, degree completion, cost, and diversity in higher education. According to some business leaders and policy makers, there seems to be little contribution from the field to help explain *why* these issues are occurring, how they could be better understood, and as such, addressed (*Manifesto*, 12). Considering the issues as it relates to the current trend of incentivizing completion rates, there is little understanding of the organizational structures and dynamics at two-year and less-selective four year institutions, which educate most of the undergraduate students in the country, and how these attributes impact completion rates (*Manifesto*, 14; Bailey 2015, 219).

Theory, at its core, is the ability to explain a logical cause for a social action; it conveys the “why of social action” (*Sticky Mechanisms*, 337). Bastedo distinguishes between the various ways to think about organizational theory, including: the concept of theory as a “covering law,” which is not universal, and specifies when it does or does not apply; or, as a “surprise machine” which highlights the nuances and paradoxes so commonly encountered in our world; or, even as a “narrative” – a representation and rich description of social processes that is “demonstrably plausible and tested empirically” (*ibid.*, 336).

Of these approaches, he favors the narrative approach, which provides the broadest understanding of educational work and practices that allows for both qualitative and quantitative approaches. It also allows for the development of social mechanisms, which, at their very best, use behavior at the micro-level to explain the macro processes that “result from patterns in micro behavior” (T.C. Schelling, as qtd. in *Sticky Mechanisms*, 338).

At the most fundamental level, mechanisms, according to Bastedo, describe a “generalizable social process by which one event influences the state of another event.” As such, Bastedo indicates that mechanisms should possess several qualities. Among the most important is the ability to “identify linkages that mediate between cause and effect.” They also unfold over time and are “generalizable to similarly situated events.” Mechanisms should be less complicated than the phenomenon they help explain. However, while generalizable, mechanisms are not universal. In fact, Bastedo points out that there is a certain “conceptual humility” about the inability to model all social life that is very appealing (*Sticky Mechanisms*, 338-339).

Examples of mechanisms

Having provided this background, he provides examples of tried and true mechanisms, including perhaps the most well know mechanism – Robert Merton’s self-fulfilling prophecy where a false belief about the future is brought to fruition through actions taken based on that false belief. The cooling-out function is a mechanism Burton Clark used to explain the behavior of counselors at community colleges, which are likely to have conflicting missions and demands placed on the institution, as they advised students to shift from an academic degree to a vocational degree as they observed students not being successful under the rigor of an academic degree.

Black boxes

He helpfully contrasts these with examples of concepts that while popular, do not rise to the occasion of being mechanisms, namely because they operate more like black boxes rather than possessing “conceptual precision” (*Sticky Mechanisms*, 344). Loose coupling is one such

example that does not unfold over time nor does it provide the casual process by which departments become more or less coupled. Garbage can theory on organized anarchies has proven to not be sufficiently precise so as to allow empirical research.

Challenges

Yet, there are significant challenges to developing these mechanisms in the world of higher education: they take careful observation, over a long period of time, and require the consistent, constant collection of data. Unfortunately, the educational data that exist in national databases today are not reliable¹⁷, often making triangulation a means to combine details sufficiently so that mechanisms can be more readily identified and developed. This is why the College Scorecard recently released by the Department of Education is such an amazing, albeit imperfect, tool. The Scorecard took data that were previously so separate they were nearly impossible to link (data such as alumni income, rates of student loan repayment, and graduation rates). The capacity required to develop and then make available such a tool is beyond what most higher education institutions can produce.

If producing a theory to adequately explain what happens inside the classroom is a challenge, it is equally challenging (but perhaps more fun!) to study what happens *outside* the classroom as it relates to government and higher education relations.

¹⁷ The National Center for Education Statistics captures graduation rates through the Integrated Postsecondary Education Systems (IPEDS) only for those students who are full-time, first-degree students. It does not capture students who attend part-time, transfer to other institutions, or for those who start, stop, and re-enter the system. U.S. Department of Education. *"A Test of Leadership: Charting the Future of U.S. Higher Education."* Washington, D.C., 2006. Web. Accessed 12 February 2016. P15. (Also known as the Spellings Commission Report)

About Principal-Agent Theory (PAT)

Originating out of the field of economics, PAT was used – as early as Adam Smith in 1776 – to explain the contractual relationship between principals (owners) and agents (managers) with the rise of absentee ownership over production means. Smith noted the concerns of owners as they recognized managers have little to gain from the profitability of the business and have incentive to shirk on their duties. This foundational relationship and its risks drives the rest of the conversation around PAT, understanding of course, that both parties aim to maximize utility.

The canonical model

Lane and Kivisto (2010) attribute the “canonical model” of PAT to G.J. Miller’s 2005 article on its political evolution. These six tenants make up the original, recognized set of assumptions around PAT: the agent’s actions have an effect on the payoff to the principal; information asymmetry exists so that while the *outcome* of the agent’s actions are apparent to the principal, the agent’s *actions and abilities* are not; the agent and principal have different interests and the agent has an interest in pursuing their interests over those of the principal’s; the agent reports to a single principal, who has a logical and *consistent* set of preferences; because the principal and agent have the same information about the parameters of the proposal and the background it’s grounded in, the principal offers the agent slightly more benefits than the agent’s opportunity costs to engage in the work; the principal can cancel the contract but both parties have the right to enter or exit the contract voluntarily (*Interests*, 280, emphasis mine).

Subsequent variations and adaptations of the theory in various disciplines and settings have maintained at their core three basic tenants: the principal, the agent, and the contract. These core

tenants can each be expanded on for applicability and relevance in how they explain government and higher education relationships.

A framework applied to higher education

PAT provides a framework to explore and investigate interests, information flows and the use of incentives to translate the goals of the principal (government/legislature) into actions of the agent (public higher education institution).

Principals typically contract with agents because they do not have the expertise or time needed to carry out their goals. In public higher education, the state/legislature/governor (in varying degrees) is the principal and serves as the hierarchical and fiscal control that contracts with an institution of higher education to fulfill educational and training services and other functions for its constituents. Due to the highly professionalized nature of academia, faculty, staff and administrators work with a high degree of freedom and autonomy (*Interests*, 761) and provide the expertise and time to carry out the educationally related goals of the state. This high level of professionalism and the freedom and autonomy, prized by institutions, presents the perfect opportunity for agents to pursue their goals at the “expense” of the principal (i.e., to engage in shirking).

Political scientists, aware of this opportunity, sought to explain the oversight that principals engage in to minimize the shirking - police patrols and fire alarms. Police patrols are always present...they are part of the deal (Lane translates these to include annual reports, site

visits, purchase approvals, etc.). Fire alarms, on the other hand, are often brought to light by interested citizens or organized groups.¹⁸

Further, as a theory borrowed from economics, the contract concept as originally laid out, was “simple” – it was a binding agreement between the principal and the agent which involved a private good – something that was discrete and easily identifiable (*Interests*, 767). In addition to there was generally only one agent and one principal. In public higher education, that hierarchical relationship isn’t always so clean – or clear: a principal could be the governor, or the chair of the appropriations committee, it may even be the president of the board of trustees. There may exist single, multiple and collective principals (*Interests*, 769).

Additionally, economists prefer to focus on the *behavior* of agents rather than how they are *monitored*. Output can be readily measured, making it more apparent when an agent may be shirking. “Production,” however, may not be so evident in higher education. First, there is no agreement on what production actually means in higher education – it more graduates, more research, more programs developed in high demand areas, more representation (i.e., access) from certain groups or populations? In higher education, the impracticalness and inability of defining production in the economic sense drives the principal instead to choose to monitor *outcomes*. Agents are therefore compensated for achieving certain outcomes. This is exactly the rationale behind performance-based funding (*Interests*, 763, 770). A principal *could* choose to require behavior-based contracts, but it is exhausting, time consuming, and perhaps even impractical to continuously monitor behavior, especially when there are no standard definitions of what that

¹⁸ For example, in Wisconsin, UW system administrators were called before the State’s Joint Committee on Employment Relations after it was disclosed that the system had a sizeable cash reserve while it continued to increase tuition rates. Though not confirmed, it is suspected that this “embarrassment to the state of Wisconsin,” provided legislators the incentive to freeze tuition, scrap the offer to set the flagship campus loose from state oversight, and inflict deep cuts in appropriations (Simmons, Dan. “Amid Harsh Criticism by Legislature, UW System Defends Cash Reserve.” *Wisconsin State Journal*. 24 April 2013).

behavior should be or look like. And so, outside the field of economics and in higher education, principals opt for outcomes-based contracts instead.

A word about shirking...and the intersection with performance-based funding

Lane and Kivisto highlight two economic models used to explain a university's shirking – revenue theory of cost and utility maximizing (*Interests*, 771). Under revenue theory of cost, higher education institutions do their best to raise as much revenue as they can - and then promptly spend it. More interestingly – and here their work intersects that of Geiger, which will be examined in the next section of this chapter – utility maximization for institutions of higher education (IHEs) is not necessarily tied to funding but rather to *prestige* and so use shirking as a strategy to build as much prestige for themselves as they can.

This is accomplished through “intra-organizational cross-subsidization.” Here, the revenue generation of a less prestigious activity at an institution funds the more prestigious work done at the institution. The more prestigious the program/faculty/institution, the higher the quality of the program/faculty/institution is perceived and thus the more prestige it brings to the institution.

Lane and Kivisto provide the example of undergraduate tuition, a relatively less prestigious activity at most selective universities.¹⁹ Tuition is charged at the rate the market will bear, which in turn is used to subsidize academic research and graduate education, where smaller classes are taught by (expensive) scholars, not graduate assistants. The authors argue the issue is self-feeding, a spiral: the more prestigious the institution, the greater revenue is brought in

¹⁹ At the comprehensive community college level, there are differential tuition rates for courses. College transfer courses cost more than technical education courses. Yet, on average, it costs less to offer college transfer courses. The higher tuition subsidizes the more expensive – and prestigious – technical education programs. For example, the college where this report takes place, has several top programs in the country (cabinet making/millwork, diesel).

through undergraduate tuition, this support in turn funds graduate education and academic research. The faculty associated with this programming will then step out of the less prestigious role of teaching and into the more personally-enhancing work of consultancy or speaking engagements (772). With full time faculty stepping out of teaching roles, Kivisto indicated this leads to less efficiencies if the goal is to increase to graduation rates: less involved faculty in the classroom lead to lower learning outcomes, which may prolong time to graduation; it leads to bigger class sizes and grade inflation (average graduation time in now six years; see also Bailey, et al., 2005).

A motivation, then, for enacting performance based funding, is to minimize shirking and better align principal and agent goals, that due to the “intangible nature of teaching and research outputs” (772), focus on surrogate or proxy measures or indicators to represent “outputs.” Indeed, popular PBF measures include graduation rates, the number of credits obtained or milestones, graduates’ employment rates, or in the case of the Wisconsin Technical College System, the number of students who transition from developmental education to credit-based occupational or technical education programming.

Seen from a political science lens, there are even more rich layers to shirking that can be added to the PAT framework. For example, in public higher education, unlike a pure economic relationship, it is difficult to exit a contract. It is nearly impossible to completely cut off funding or sever a relationship with a public institution or do away with part of its bureaucracy, especially when the role it plays in teaching, research, workforce and economic development, is so salient to the success of the principals’ constituents. This, the authors surmise, tips the balance of power in favor of the public IHE given that the principal has very limited options to achieve

their goals around higher education, economic growth, and workforce development, without the institution (*Interests*, 776).

...And the complicated world of principals

The authors indicate that the greatest challenge in applying PAT to higher education may be identifying who the principal might be. The reality is that in complex bureaucracies with many facets to the institutional mission, there exists more than one principal, who may very well have conflicting goals (trustees may have different goals than presidents, who may have different goals than deans, who may have different goals from department chairs – and the faculty may have to report to all!). Which principal would take precedence? Who would be subjugated? Political scientists would argue –like the economists – that the agent would choose whichever option/principal provides or allows for the most utility maximization. The challenge the authors note is that it may be difficult to assess what utility maximization may mean in these cases – it would not simply be money or profit as it would be in the marketplace. As noted earlier, autonomy might be more important to a public IHE than appropriations.²⁰ Collective principals is a particular problem because there may be conflicting interests to perform to. In choosing one over another, could the need to appease different principals be construed as shirking?

Lastly, the authors warn of the assumptions that are made in viewing how an IHE responds to single, multiple or collective principals and the outcomes they perceive to be important. For example, it is much easier to measure a graduate's wages than a student's level of culture, therefore making it more appealing to principals at the legislature level to want to

²⁰ This was certainly the case in Wisconsin where the flagship was willing to take a significant reduction in state support in exchange for being moved out from under the oversight of the state and its respective laws. While the significant reduction in appropriations occurred - a \$250 million cut - in the end, the flagship did not separate from the state system of oversight and the chancellor who championed this move, promptly resigned.

replace humanities courses with more career and technical education courses to affect wages.²¹

In fact, this very type goal has led policymakers and business leaders to question the value of the liberal arts academy. And yet, even as the question of whether higher education is worth the investment for students and families, especially as the college-educated are finding it difficult to get jobs, academia makes the argument that a broad-based liberal arts education provides the foundation necessary to adapt and evolve in today's world of work (Cassidy, *College Calculus*).

...More on maximizing prestige and shirking

The power of PAT is its applicability, even as the relationship evolves. During the admissions process, for example, the student is the principal and the agency is the institution. The student “buys” the prestige and reputation of a particular program/faculty/institution. In taking the student on, however, the role changes and the principal becomes the institution and the agent is the student. The institution has an interest in the student graduating, perhaps earning prestigious scholarships or awards so as to be successful and represent the institution well. The student is expected to behave according to certain standards (“rights and responsibilities”) and not “tarnish” the school's reputation.

Relations with alumni, too, can be viewed through PAT. Institutions impart awards, recognitions, and support alumni with career services so they can find better jobs, which will bring more prestige to the institution, and even better students. Employers buy into this too, often hiring on prestige of institution, not necessarily the merits of the graduate (see Cassidy in *College Calculus*). In the realm of philanthropy, a donor (the principal) may provide the

²¹ Again, drawing on the recent Wisconsin example, the Governor was recently outed as the source of the attempted change to the Wisconsin Idea – the search for truth and knowledge – in exchange for workforce development. Taken aback by the outcry, the Wisconsin Idea remained unedited.

institution (agent) with dollars or goods under specifications as to how these will be used. The institution, however, usually prefers donations that are not explicit so they can use them in activities that will “best serve” the institution and garner more prestige, such as scholarships or endowed professorships (*Interests*, 289-294).

Shirking may also be caused, in part, by information asymmetry. This simply means that the agent has such a specialized knowledge that the principal is unable to truly assess or oversee their work. For the principal, the risk is real and it can lead to what is termed a moral hazard (where the agent engages in acts contrary to the goals of the principal) or adverse selection, where the principal, due to lack of specialized knowledge, is unable to confidently determine the ability and skills of the agent to carry out their work (*Interests*, 284). Of course, this can work the other way, too, where due to information asymmetry, the principal will compensate the agent only to the extent necessary to get them to agree to the contract. ²²

Citing the swelling of administration ranks, PAT has been used to demonstrate how behaviors like the academic ratchet and administrative lattice are linked to full-time faculty shirking responsibilities in order to maximize prestige. Faculty, it is argued, once they earn tenure, shirk on activities that cannot be easily monitored by the principal such as teaching and other “less preferable” tasks like committee work or advising. Faculty may choose to focus instead on those activities which they enjoy more or from which they receive more recognition or prestige or additional income, such as research or consulting. Explaining the work of A. Ortmann and R.C. Squire in 2000, Lane indicates this behavior is known as the “academic ratchet.” In response, the supervisory administrator, representing the institution, who truly cannot

²² An example of this may have been the recent changes in tenure protection being removed from Wisconsin’s statutes and oversight moved solely to the Regents, or the curtailing of public union powers in state government whereby negotiations were based solely on wages and raises solely on CPI levels. It was not total removal of tenure protection, nor was it a total outlawing of negotiations; rather, it was just enough to keep most people at the table.

force the tenured faculty member to do the less appealing work, nor wanting to do it him or herself, hires another administrator to do the work instead. This is the administration lattice: the “bloating” of administration which, Ortmann & Squire argue, is a direct result of tenured faculty no longer engaging in the work they used to do but which needs to be done nonetheless.

Critiques of PAT

Even as PAT is able to account for changing relationships, it does not do a good job of explaining the “psychological dynamics” of behaviors that are the basis of relationships. These are intangibles like altruism, or the different strategies principals and agents may employ to meet shared goals, or team work where the “production” environment is complex and the nuances of the roles faculty and administrators play to move scholarship and teaching forward are not so readily evident.

More recently, it has been recognized that the lack of clarity or cohesion around a principal’s preferences can also lead to a misunderstanding of the goals. Further, the multiple layers of bureaucracy that can come between the ultimate agent and the ultimate principal may also obfuscate preferences. And it is out of this ambiguity that the agent acts in ways contrary to the goals of the principal.

At times, it is the underlying incentive infrastructure the principal creates that can lead to a misalignment of goals and actions. For example, Lane indicates that universities often state goals around the importance of teaching and service. The reality is that research and related activities bring the faculty more recognition and prestige, thereby bringing the university more recognition and prestige by affiliation (*Interests*, 283).

Some don't like it because it makes everyone out to be a dishonest opportunist – principals and agents alike.

Plainly, PAT is by no means a perfect lens by which to view government and higher education relationships or intra-institutional relationships. Michael Bastedo classifies this limitation as “conceptual humility” - the inability to model all social life (*Sticky Mechanisms*, 338-339). The model, like all good theory, attempts to simplify, to have the best explanatory power yet be rigorous enough to handle complex and evolving realities. While the theory rises to this challenge, for some, it is seen as too cynical: not everyone is an opportunist. Should agents engage in shirking behavior, it's typically something that is done unintentionally given the lack of clarity around goals, principals and preferences that the “real world” brings.

Provides basis of understanding rise of performance based funding (PBF)

As such, the flexibility and simplicity of PAT to explain PBF is appealing. The principal contracts with the agent to provide a good or service itself cannot provide due to some limitation. And yet, the principal needs to ensure accountability is provided for in the contract. The contract is based on the principal's goals and the agent's delivering on that goal. The basis of the contract is money, i.e., funding – either more money as a bonus to current appropriations, or as generally increased appropriations, or solely as the means by which appropriations are made, period. It seems simple enough.

Yet, performance based funding has thus far not proven to be as successful as policymakers had hoped. For those institutions that already have a significant share of prestige, small amounts of money (which is what it's been thus far) do not matter - they will continue to get the top students and the best faculty simply based on their reputation. On the other hand,

institutions that do not have a large share of prestige, or have missions that legislate open access (like community colleges), the small amounts of funding do not allow these institutions to build their capacity to appropriately collect data and document or track outcomes. Nor do they have the funding necessary to hire sufficient personnel to address readiness or non-cognitive issues that students attending these institutions often bring. This will be re-visited in the section on PBF once the issue of rising tuition costs has been examined, which is what we turn to next.

The Marketization of Public Higher Education

As public funding levels for public higher education dropped, schools raised tuition to make up shortages, especially the highly selective universities that could boast significant resources such as large research grants, strong private/public research industry relations, healthy endowment funds, or generous, wealthy alumni. Federal financial aid, meanwhile, did not rise fast enough to meet neither the increased costs of attendance nor the increased demand as more Americans started attending college. Simply, state coffers experienced a significant decline in funds while demands on those funds continued to increase, especially as federally-mandated programs such as health care for the poor and expanded k-12 access grew, along with the exponential growth in corrections. Public higher education was left to figure out how to make up the shortfall and all schools, at varying levels, raised dollars through increased tuition.

Those students whose families were able to pay out of pocket for the increased costs, did. These students tended to be wealthier, white, and very well prepared for college-level work. Those whose families did not match this profile were increasingly shut out of great public IHEs. Thus began the “arms race” Roger Geiger refers to in his 2010 article entitled “*Universities and*

Markets.” This cycle of the best attracting the best (funding and students) and therefore students expecting the best upon graduation (jobs) has looped into itself so that the more selective the institution became, the more prestige it could claim for itself. This is seen through the hiring of star faculty who will partner with private industry to invent or patent breakthrough technological innovations. Star faculty will certainly attract star students. In admitting exceptional students, they in turn become highly successful alumni, who complete the loop of prestige through generous giving or proud representation. Further, unwittingly, the recent College Scorecard tool released by the federal Department of Education further exacerbates this cycle by publishing alumni wages ten years post-graduation. Becky Supiano in a recent article in *The Chronicle of Higher Education* (27 May 2016) documents that the intended consumer of the College Scorecard has not been Pell grant recipients (the poor college student) but rather:

"The impact...is driven almost entirely by well-resourced high schools and students." When the researchers looked at parental education, the Scorecard's impact was concentrated among students whose parents had at least some college. When they looked at race, it was concentrated among students who were white and Asian. And when they looked at school type, it was concentrated among those attending well-resourced public — and even more so, private — schools.

"The subgroups of students expected to enter the college-search process with the most information and most cultural capital," the researchers wrote, "are exactly the students who responded most strongly to the Scorecard."

This marketization of public higher education where families and students are willing to bear the cost to access the institution, has led Geiger to make two observations about this new

state of education. First, he states that students are no longer clients who are ready to learn from professionals. Rather, they are now *customers who are always right*. Because they are purchasing an expensive product that will determine which highly successful pathway their future will take, they have every right to require luxury dorms, on-demand support services, and state-of-the-art learning and athletic facilities. Second, Geiger fears that given the increased expectations for business and industry research collaborations, public universities will lose their “privileged role as disinterested arbiters of knowledge.”²³ These two shifts, while ironically providing selective public institutions with significantly increased fiscal resources,²⁴ have also “diminished the sovereignty of universities over their own activities... (and), weakened their mission of serving the public...”

Students who are shut out of the selective public institutions are increasingly turning to less-selective four year schools, with many of the poorer, minority students beginning at community/technical/comprehensive two year colleges. According to the American Association of Community Colleges *2016 Factsheet*, 46% of all U.S. undergraduates enrolled in community colleges. This includes 41% of first-time freshmen and 36% of first generation students. Minority students are overwhelmingly represented in community colleges where 62% of Native American, 57% of Hispanic, 52% of black, and 43% of Asian/Pacific Islander students attend. Most students (62%) attend part-time. Nearly ¾ of the students who attend community college part-time, work in either part-time jobs (32%) or full-time jobs (41%).²⁵ At the community

²³ Geiger, Roger L. “Universities and Markets.” *Organization and Governance in Higher Education*. Sixth Edition. Ed. M. Christopher Brown II. Boston: Pearson Learning Solutions, 2010. 737-758. Print.

²⁴ Ibid. Geiger notes that the rate of spending per student “rose by 62% at public universities and more than double that at private institutions” (756).

²⁵ See website <http://www.aacc.nche.edu/AboutCC/Documents/AACCFactSheetsR2.pdf>

college where this study takes place, minority students are overrepresented in enrollments based on district representation, the average student age is 28, and most students attend on a part-time basis.

Normally, in a market, the actions of selective public IHEs would be praised as efficient. However, in public higher education, legislatures across the country, weren't quite ready to make this leap and instead sought to move what they perceived as an unresponsive, irresponsible, bureaucracy.

Rise of PBF as an Accountability Mechanism

In the 1980's, the call for greater accountability, responsiveness, and a substantial shift in economic fortunes provided fertile ground for the rise of performance based funding. The focus moved from access and inputs to outputs and outcomes, from enrollments to completion. In 1979, Tennessee was the first state to embrace PBF. Proponents were higher education insiders who saw a need to get ahead of declining enrollments, declining appropriations, shifts in the demands technology placed on workers, and "imminent" external accountability measures.²⁶ PBF was embraced by the state and was legislated as an added bonus to their base appropriation. PBF spread to other states, but interest didn't last long and legislatures moved away from the practice. Although notably, Tennessee has never turned away from the practice, making it the longest practitioner of PBF.

²⁶ Ahedo, p 16

Doughtery and Reddy note performance based funding is “rooted in a resource dependence perspective” and that as such, legislators, as principals, believe that if a pot money is made available, “people would change their behavior in order to chase that money” (2).

If money isn’t a sufficient motivator to act, then raising institutions’ awareness of how they are or are not performing to the state’s goals might be. And if neither of these serve as sufficient motivation to change behavior, then the level of prestige an institution is afforded by how well they are meeting the state’s goals – in comparison with their peers - should be a compelling inducement (i.e., public shaming).

The 2006 Spellings Commission report indicates:

Compounding all of these difficulties is a lack of clear, reliable information about the cost and quality of postsecondary institutions, along with a remarkable absence of accountability mechanisms to ensure that colleges succeed in educating students. The result is that students, parents, and policymakers are often left scratching their heads over the answers to basic questions, from the true cost of private colleges ... to which institutions do a better job than others not only of graduating students but of teaching them what they need to learn (US Dept. of Education, x).

It’s only been within the last ten years that a second wave of PBF has arisen, prompted by observations such as those noted above. PBF 2.0 differs from 1.0 in that there are no extra or bonus dollars. Rather, nearly $\frac{3}{4}$ of states use PBF 2.0 as a tool to *fully* allocate higher education appropriations, albeit shrinking ones. In Wisconsin, PBF 2.0 was adopted in the last biennium budget. This fiscal year will see 30% of the technical college system allocation made based on

nine performance measures. The technical college system will in turn allocate dollars to each technical school based on performance on seven of the nine measures, *inter alia*. The individual colleges select the seven measures they wish to be measured on; see Appendix A for Wisconsin's PBF measures.

Tentative results of PBF

Because PBF has overwhelmingly turned to outcomes that enhance completion versus access, it has been difficult to measure the success of legislatures influencing their institutions' completion rates. Part of this difficulty has been mentioned previously, namely, the institutions' lack of capacity to capture data and report outcomes. This can be further exacerbated by states that do not have a robust data collection system (for example, currently in Wisconsin, graduates of higher education institutions cannot be tied to unemployment data, which collects wage information). Another barrier to truly measuring cause and effect has been, as Hillman, Tandberg and Hicklin-Fryar in their 2015 article have pointed out, the inability to run a true, vigorous experimental study with control groups. Lastly, there simply has not been enough time to capture results –student life cycles, especially when so many of them are attending part-time, are outside of the six-year period in which IPEDS measures completion. While these are certainly challenges, Hillman, et al., have reconstructed in that 2015 article, perhaps the most rigorous study of PBF success to-date despite these limitations.

The authors examine the success of the much-praised national model known as Student Achievement Initiative (SAI) found in Washington State's community colleges. SAI was "revolutionary" in that it sought to address sticking points in students' progression through pathways so the colleges could understand, address, and hopefully eliminate, these sticking

points that may prevent students from reaching and completing long-term goals. Further, SAI supported the theory that in completing short-term or lower-order goals (through the chunking or modularizing associate degree or technical diplomas), students would have “completion momentum” and continue on for those higher-order goals, longer-term credentials.

Given the limitation of creating control groups, they designed a quasi-experimental study: in addition to the 31 technical colleges in Washington, they also examined 176 other two-year schools from twelve Western states; they further compared Washington against states that share a border with states that did not implement PBF (18); and for good measure, compared Washington to 21 other non-PBF colleges in other states (64 colleges).

What they found was that Washington had lower retention rates than their neighboring peers (the Western Interstate Commission for Higher Education or WICHE with sixteen member states) and that they produced more certificates per year than the comparison group, particularly short-term certificates of one year or less. Further, SAI led to the reduction of completion rates for long-term certificates; and, higher order outcomes were not as positive as had been expected. In fact, SAI has encouraged colleges to ensure students receive certificates retroactively, embedding of short-term certificates or modularizing and chunking out the degree as student stop out to work, take care of family obligations, etc. (Hillman, et al., 2015, 515)

The authors question whether the reason there hasn’t been a great uptick in credential completion is because improving outcomes/completion is complex work. It’s not so straightforward and takes significant resources – additional staffing, professional development for its faculty, additional programming – an investment that most state legislatures are not making and that colleges have to intentionally build. It has been speculated that an unintended consequence of PBF, in fact, has been that the funding level is so small for those that don’t have high levels of

prestige that it has not been enough to help these colleges build capacity – to support completion, to gather and interpret data, to increase professional development to address strategies to increase retention and completion rates, to more fully support students by reducing opportunity costs of attending school, etc.

Lastly, the authors point out that an increase in short-term certificates is problematic because the labor market has not yielded returns much beyond that of a high school diploma. Conversely, long-term certificates, those that take a year or longer to complete, do lead to increased wages.

Dougherty and Reddy in their 2011 review of PBF 1.0 in the states of Florida, Tennessee and Washington, also found it difficult to definitively demonstrate success of PBF in improving student outcomes. Their focus was on what many states indicate is their ultimate concern – student success demonstrated by increased retention rates, transition out of developmental/basic education, a decrease in unnecessary credit accrual, graduation and job placement in field of study (25). Noting the difficulty of isolating PBF effects from enrollment trends (higher education – especially at the two year college level – is often counter-cyclical – enrollments rise when the opportunity cost to attend decreases, as with recessions), they did not see increases in completion rates. In fact, Dougherty and Reddy cite several authors (Fryar, 2011; Shin, 2010; Tandberg, 2008; among others), who although they found positive impacts in completion rates (save Fryar, who found a marginally significant negative impact), none of the rates were statistically significant and ultimately, difficult to attribute to PBF.

What the authors *did* find was that there was greater awareness of state priorities and how an institution measured itself against those. They also found that schools tried to make better use of institutional data, if they had the capacity to collect and analyze it, and how data they

collected was used to implement academic and student support services policy and practices to enhance student success.

Challenges to PBF

Dougherty and Reddy note the challenges that agents (IHEs) have in meeting the goals of their respective principals: if the student has secured a job before they complete their program, is that student a drop-out? is a student who transfers to a four-year school before completing the associate degree a drop-out? what counts as a successful job placement – in-state, out-of-state, high wage, or high demand? how do you best allow for the differences in mission that emphasize access at one institution and research at another? how can administrators best plan to provide wrap around services, especially for those schools who serve a large number of “at-risk” students, when budgeting is uncertain and not sufficient? how does a school plan and report on measures when they are continuously changing? how do IHEs compete for funding with other institutions who, largely based on where they are situated, have more robust economies and so fare better in terms of job outcomes? Would schools be accused of shirking for raising these seemingly legitimate questions?

Unintended consequences

To date, several important issues have arisen that, if not addressed, can stand to limit the effectiveness of PBF. For example, compliance costs are especially problematic for small schools that do not have the resources (financial or human) to devote to robust institutional research departments. Also, with an ultimate motivation of PBF to prepare students for the workforce, several schools note that their focus on transfer was not supported, nor were

programs that placed students into lower paying jobs that nonetheless served “local interests” like childcare or nursing assistants.²⁷ Faculty, while reporting that they were not overly aware of how PBF affected their work in the classroom, did report that they felt pressured to retain as many students as possible, leading to a lowering of academic standards. Some schools narrowed their mission in an effort to eliminate the retention issue on one end and so accepted students who were more college-ready and better prepared to perform. To increase completion rates, some schools limited the number of credits for their programs, eliminating opportunities for general education or elective courses, thereby narrowing the scope of the program (Dougherty and Reddy, 29-42).

If indeed the earliest results of PBF have indicated a narrowing of mission and scope of higher education, how does this limitation impact the very issue – workforce preparation – that allegedly drives the conversation? The skills gap is explored in the next section.

Understanding the Skills Gap

Claudia Goldin in her 1998 article “*America's Graduation from High School: The Evolution and Spread of Secondary Schooling in the Twentieth Century*,” notes that in states where manufacturing was not historically strong (i.e., less than 20% of industry jobs), there was a larger number of high school educated youth. These states tended to be more homogenous and wealthier (Great Plains and Western states). Relatedly, in states where manufacturing was strong and where there was a large number of employed youth and unskilled labor, the opportunity cost

²⁷ In Wisconsin, there are three technical colleges that offer college transfer programs. None of the PBF measures include college transfer. At the community college where this study takes place, 40% of enrollments – and the largest source of tuition revenue to provide that cross-subsidization for technical programs – are within the college transfer program.

was greater to go to high school. This bore out during the onset of the Great Depression when high school enrollments were at record levels in industrialized states (particularly the east and north). And this was reflected again in the decreased high school enrollments during W.W.II when young people who didn't qualify for conscription were taking well-paying jobs in manufacturing. So, when manufacturers closed their doors and millions lost their jobs, the opportunities for low-skilled, low-educated men (mainly) were scarce.

The state of manufacturing today

Given the importance of the manufacturing industry to the U.S. economy,²⁸ it is not surprising the deference afforded to it. Not unaware of this position, it has used its influence to drive the agenda around what it terms the *skills gap*: the inability to find qualified workers for their jobs at the rates they are willing to pay. The leading economic interest group, started in 1895 with today more than 6,000 members, is the National Association of Manufacturers (NAM). NAM frequently surveys its constituents to learn about their pressing issues and publishes its results.

In 2001, members were randomly selected to take a survey on employee management and knowledge capital. Approximately 10% of their members responded. The findings indicate several trends. The most serious workforce shortage was among hourly employees like production workers and those that support them (operators, machinists, craftworkers, engineers). Many companies (69% of respondents) noted the top deficiency among hourly position applicants and candidates was a lack of *basic employability skills such as attendance, timeliness,*

²⁸ For the last available year according to the Bureau of Economic Analysis, manufacturing is responsible for nearly 1/5 of total U.S. economic output, larger than any other industry, at \$5.9 trillion in 2015.

work ethic, etc. Most turn-over occurred within the hourly worker ranks and the most common reason cited for leaving was for higher wages. Seventy-eight percent of respondents believed public schools were failing to prepare students for the workplace, which represents little change from the 1991 and 1997 surveys, despite a decade of various education reform movements. *Respondents said the biggest deficiency of public schools was not teaching basic academic and employability skills.* The survey found that technical and community colleges and business associations were companies' top sources for outside training.

The authors indicated that the industry suffered from an image problem, impacting its ability to hire competent workers. They worried that: the exodus expected with baby boomer retirees would severely negatively impact their knowledge base; that immigrants did not have the adequate education or language skills to be competitive in this work; the overemphasizing of four-year college attendance by educators, students and parents eclipsed rewarding careers in manufacturing and other sectors that require a training certificate or two-year degree; and, that while jobs are growing in the industry, these were often overlooked.

In their 2015 follow-up report, based on responses from 450 executives, the authors concluded that the skills gap was real, substantial, and it would impact companies' ability to meet production demands. It would hinder their ability to implement new technologies and threaten productivity. Not finding sufficient talent would negatively impact decisions to re-shore jobs to the U.S., even though the hidden costs of off-shoring are significant (2015, 16).

Issues contributing to the manufacturing skills gap & industry recommendations

Issues contributing to the skills gap – some of which are internal to the industry - are more thoroughly identified. First and foremost, they acknowledge that the industry has an image

problem – young people are not interested in manufacturing and many have an outdated idea that manufacturing is dangerous and dirty. The authors emphasize how technologically-driven, clean, and safe modern manufacturing is today and the importance of driving that message. They encourage industry to promote manufacturing as a career choice to not only high schools but to parents who prefer their children move into different career areas (currently seventh place on the top seven career industries with Generation Y). Additionally, the numbers of high school students interested in Science, Technology, Engineering, and Math (STEM) fields start out strong and diminish over time, leading to a scarcity issue.

Secondly, wages are not high enough to attract talent. Perhaps heeding criticism that the reason for the skills gap was the industry's unwillingness to pay higher wages, this survey asked respondents how likely they were to pay higher wages to attract more workers (noting that wages grew by only 3% from 2001-2013); 10% reported they would be willing to pay 11-25% more and 68% 1-10% more (2015, 14). Third, industry indicates that they still can't find the "right talent"; they have a hard time finding candidates who pass basic screenings or probationary periods (2015, 15).

The report provides recommendations to help address the skills and talent gap including internal promotion, use of analytics and tools to better determine skills aptitudes and needs, and, partnering with K-12 systems to develop a STEM pipeline. More importantly, the authors urge industry to consider an increased investment in training. "(F)ocusing on internal training and development programs hold the highest promise to mitigate talent shortage among both the skilled production workforce and engineers, researchers, and scientists" (2015, 24).

Divestment in employees, training, and wages

Indeed, several scholars have indicated that the skills gap could be addressed if employers were willing to once more invest in their workers.

Maureen Conway of the Aspen Institute argues that since the late 1970's, American businesses have slowly divested themselves from its workforce, a short-sighted approach that has taken its toll on the very fabric of American society. While cuts in wages and benefits have improved profit margins, the overall effect has been detrimental, creating "arms-length relationships between employers and workers, weakening trust and dampening enthusiasm for work." This view is supported by NAM's 2001 report which indicates most employee turnover is caused by those seeking higher wages. Business divestment has been accompanied by declining public sector divestment as governments at all levels sought to reduce tax burdens.

Rather than liabilities, Conway states that people are employer's best assets and highlights the work of Zaynep Ton, at MIT's Sloan School of Management, who details how four retailers succeed by investing in their workers. They train workers well so they are able to contribute more broadly to the company, they offer pay and work schedules that are deemed fair and provide a "measure of economic stability and security," and, they empower workers to make decisions, solve problems and contribute to the business in meaningful ways. They demonstrate the value they hold for their human resources.

Lastly, Conway posits that the business community's problem today of lacking skilled workers may indeed have been caused by the very same people who led the divestment in this population, unknowingly sowing today's poverty and increasing income inequality. She cites research indicating the limitations poverty puts on people, noting that living in poverty undermines worker performance and productivity. She further states that it is impractical to

expect poor people to build skills and then work their way out of poverty when poverty is an underlying factor in reduced cognitive performance, thereby impeding skills attainment and performance in the workplace. Noting the work of Robert D. Putnam (*Our Kids: the American Dream in Crisis*) who found that immediate college entry was best predicted by parental education, “mostly because children from better educated homes got more encouragement to attend college,” she concludes that poor families cannot invest in the education and development of their children, decreasing college-going behavior among the poor. To stem the tide, she calls for changes in public policy and implementation of business practices that both drive business profit margins *and* lift the workforce that makes these businesses run.

Peter Coy, writing for *Bloomberg Business*, argues that while businesses are getting bigger, workers are not seeing the benefits to larger profits, especially in those areas where there is significant consolidation in the industry. Companies can pay out these larger profits to either the government in the form of higher taxes, shareholders in the form of profits, or workers in the form of wages or salaries. Expanding on Conway’s argument, fewer and fewer large companies are choosing to invest in their employees. Economists venture that the decline in worker unions and employees’ fears of being replaced should they complain contribute to this weakening of workers’ voices.

Indeed, Peter Cappelli, in his 2012 book *Why Job Seekers Don’t Land Jobs* notes that businesses of today want to hire “plug and play” employees – those who require no on-boarding or training and are able to contribute immediately since they’ve already done the work. He further indicates that human resource professionals – not the CEOs – have the real pulse on why people are not being hired and they claim it’s the very tool that is supposed to make their job easier: automation. Inundated with thousands of applications, these professionals turn to software

that scans for key words relevant to that job. Use the wrong key word and applicants are removed from the pool. That's not a measure on the skills the applicant may possess – it's an indictment based on word usage.

Further, the disconnect on wages is problematic. While manufacturers cite they have some of the highest wages, they often include the cost of benefits in their analysis. Entry-level wages are often less than generous, according to Career Pathway data at the college. These wages are often from \$10-\$12 per hour. A living wage in this area for an adult is \$10.78/hour. For those with one child, it quickly moves to \$23.55/hr.²⁹

The issues of training and pay are perhaps even more important as Wisconsin, like Iowa, is categorized by the OECD as a low skill, low demand state, putting them into what they call a “low skills equilibrium.” Only fourteen states in 2012 were found to be in high skills equilibrium where there was a match between a high percentage of people with post-secondary education working in high skills jobs (percentage of medium- and high-skills occupations and income).³⁰ Interestingly, many of the states noted in the OECD report as being either high- or low-skills equilibrium, overlap with a map of the percentage of states' workforces in manufacturing in 1977. Some states, clearly, have yet to recover or re-imagine themselves from a manufacturing legacy. See table 1, based on data from OECD and the Nextec group and an EPI Briefing Paper.³¹ States that high-skills equilibrium tended to have a higher share of knowledge intensive services as part of their workforce. The darker the shading, the larger share of manufacturing of their workforce in 1977.

²⁹ Living wage calculator. Found at: [//livingwage.mit.edu/metros/31540](http://livingwage.mit.edu/metros/31540)

³⁰ See the 2012 OECD report at this link for additional information on the United States.
http://www.keepeek.com/Digital-Asset-Management/oecd/industry-and-services/job-creation-and-local-economic-development_9789264215009-en#page355

³¹ See <http://www.nextecgroup.com/blog/changing-landscape-of-american-manufacturing/> and <http://www.epi.org/files/2015/bp388-manufacturing-footprint.pdf>

Table 1. States who have high or low skills equilibrium in 2012 and their level of manufacturing workforce employment in 1977

State	OECD 2012 High- or Low- Skills Equilibrium State	Nextec % of Workforce in Manufacturing in 1977	EPI % if Workforce in Manufacturing in 2013 – Top States
California	High	15-19.9	
Colorado	High	10-14.9	
Connecticut	High	25-29.3	
Delaware	High	20-24.9	
Georgia	High	20-24.9	
Illinois	High	20-24.9	
Maryland	High	10-14.9	
Massachusetts	High	20-24.9	
Minnesota	High	15-19.9	
New Jersey	High	20-24.9	
New York	High	15-19.9	
Oregon	High	15-19.9	
Virginia	High	15-19.9	
Washington	High	15-19.9	
Alabama	Low	20-24.9	13.1
Arkansas	Low	20-24.9	12.9
Florida	Low	10-14.9	
Idaho	Low	10-14.9	
Indiana	Low	25-29.3	16.8
Iowa	Low	15-19.9	14.0
Kentucky	Low	15-19.9	12.4
Louisiana	Low	20-24.9	
Mississippi	Low	20-24.9	12.3
Missouri	Low	20-24.9	
Nevada	Low	4.4-9.9	
New Mexico	Low	4.4-9.9	
North Carolina	Low	25-29.3	
North Dakota	Low	4.4-9.9	
Ohio	Low	25-29.3	12.6
Oklahoma	Low	10-14.9	
Rhode Island	Low	20-24.9	
South Carolina	Low	25-29.3	
South Dakota	Low	4.4-9.9	
Tennessee	Low	25-29.3	
West Virginia	Low	15-19.9	
Wisconsin	Low	20-24.9	16.3
Wyoming	Low	4.4-9.9	

Finally, in the college district, the ten fastest growing occupations in the next five years demonstrate this bifurcation of skills levels: 3 of the occupations are high skill, requiring significant post-secondary education (personal finance advisors, software developers, and registered nurses); 6 of the occupations are low skill, requiring little to no post-secondary education (food prep and serving, personal care aides, janitors and cleaners, laborers, maids and housekeepers, home health aides); and one is medium skills, requiring post-secondary education (secretaries and administrative assistants).³²

Skills that matter to employers

Top administrative leaders surveyed this college's business stakeholders. Results from over 900 responses mirrored the 2015 NAM study: businesses indicated that the following competencies and skills were very important or important in ranked order, with most important first: communication (98.3%), critical thinking (98%), self-management (95.5%), social interaction (95%), and ethics (92.7%). Hard skills and content knowledge, such as science and technology, and mathematics were still important, but less so at 69.6% and 65.9%, respectively.³³

Matthew Hora (2013) observed that academic researchers have been much more skeptical about the existence of a skills gap. He cites the work of Cappelli, who boldly observes the insignificant role of academia in investigating a labor problem. Instead, he finds that those who

³² Tambone, Alissa. Madison College. Office of Institutional Research and Effectiveness. "Addressing the Increasing Demand for Employees with Associate's Degrees in the Wisconsin Job Market."

³³ Bakken, Turina, and Timothy Casper. "Monitoring Report: Board Ends 1.2.1: Community Leadership & 1.4: Communities." Madison Area Technical College Board of Trustees Meeting, Madison. 10 June 2015. Web. 19 Apr. 2016. <<http://madisoncollege.edu/files/users/ehustad/MonitoringReport%234.June2015.pdf>>.

have a material interest in the outcome dominate the discussion, produce poor quality of evidence, and yet cannot appreciate that the stakes are high should the problem not be adequately or appropriately addressed.

Based on prevailing economic theory, Hora notes the work of Mark Levine of UW-Milwaukee who found that there were no increases in average weekly hours or average wages in occupations experiencing a “skills shortage” (Hora, 3). The Wisconsin Manufacturers and Commerce Foundation (the State’s Chamber of Commerce) charged that Prof. Levine could not make this determination as he had not had a conversation with any CEO’s.

The experience of advanced manufacturing and biotechnology companies

Hora (2015) took up this challenge and interviewed 141 employers and educators in Wisconsin to learn more about the skills gap problem. He specifically was interested in learning which skillsets employers and educators considered essential for long-term success in their fields; how these skillsets were being fostered in educational programs *and* workplace training; what was the nature of education-industry relations; and, to what extent did these relationships impact how skills are valued and fostered in these areas.

Hora found that the current focus on technical proficiencies fails to account for the diverse skills employers desired and recommended that policymakers support postsecondary programs and curricula that cultivate both technical (“hard”) and non-technical (“soft”) skills, including apprenticeships and interactive classroom instruction. Note that his argument is the same that Berryman had been making in the early 2000’s, and it was the same argument made in 1906 in support of the then-nascent public high school movement.

The skills most identified across the 141 interviewees, in order of salience to both employers and educators, were: technical ability, work ethic, and technical knowledge. The top pick for employers was work ethic and for educators it was technical ability. Skills identified solely by employers include self-motivation, interpersonal skills, and experience. Skills identified solely by educators include critical thinking, innovation, detail-orientation, and troubleshooting. Educators can foster or cultivate both non-cognitive and cognitive skills through active learning strategies which integrate theory and real-world experience (again, back to Berryman's observations from twenty years ago). Teaching strategies and tools educators may employ to teach these skills include "teamwork-oriented instruction, problem-based learning, and communication-related assignments" (2015, 5). When industry experts are hired to teach, investment in professional development has to occur so they develop the teaching skills to develop these pedagogical techniques and impart both of these types of these skills.

Recognizing that there are classes that are completely dedicated to hard skills, the use of general education courses to "round out the student" are important to support the cultivation of soft skills, particularly in communication. Assuming educators have prepared candidates with cognitive and non-cognitive competencies, employers indicate they hire on employee "fit" so they can invest in additional training to meet company needs. Hora, however, found that only 13% of the employers he interviewed offer formal training programs and that most, 32%, rely on informal job shadowing.

The breadth and depth to educator/industry relationships also affected outcomes for students developing competencies and it was through student pathway programs that students and employers had the best opportunity for successful outcomes. Through internships and apprenticeships, industry field trips and tours, classroom visits from local companies, career fairs

and networking sessions, and class projects suggested by industry, there was increased hands-on training, increased social and cultural capital (knowledge of industry needs), tips on jobs, and exposure to careers and industries.

Hora's policy recommendations included: encompassing a broader definition of skills to include soft skills to match views of Wisconsin employers; providing professional development funding to educators and company trainers to learn and employ active learning teaching techniques; supporting general education *and the liberal arts* where students learn higher-order skills like critical thinking, collaboration and communication; broadening the focus on jobs beyond both middle skills which call for an associate degree or less, to those others that require at least a bachelor's degree, and to industries other than manufacturing, which represents 11% of Wisconsin jobs, and which, when compared to other sectors, on average, do not pay family supporting wages. He illustrates his point by noting that the Wisconsin Fast Forward initiative, designed to increase training investment for targeted state industries was distributed over three rounds of grants. In the first round of grants, post-training wages of \$17.19/ hour were required. In round two, wages requirements were dropped to \$12.17/hour. A family supporting wage in this area of the state is over \$20/hour.

He goes on to recognize that student pathways could be a means to build the competencies employers seek in students. He encourages close collaboration in the classroom so that students gain "cultural capital." Responding to critics like the Wisconsin Manufacturers and Commerce Foundation, he stresses that to charge that the educational sector in emphasizing liberal arts education has been the *cause* for the skills gap is too simplistic. Rather, the current situation of skills mismatch is caused by a complex mix of factors that draw from the economy,

business and industry practices, parent and family preferences, state's preferences for funding, and educators' ability to respond to changing demographics and challenges in the classroom.

National & Institutional Responses to Addressing the Skills Gap and Income Inequality

The review on national and institutional responses provides an overview of several facets: the development of career pathways - work that has taken nearly two decades to bring to the educational “frontlines”, largely supported by national philanthropic foundations - and, understanding how the very character of community colleges can affect the success of its students completing degrees.

Career Pathways...The Answer?

Sara Rab in 2003, writing for *Educause Quarterly*, explored the earliest attempts to build career pathways at the community college level. Based upon the experience of three leading states (North Carolina, California and Washington), the commonalities of their programs included: concerted outreach to disadvantaged adults; leveraging community-based organizations to provide basic skills coursework; entry-level training; internship placement; entry-level employment; and, more advanced training (Rab, 62). Programs focused on employer sectors that offered higher-wage jobs and career progression. For community colleges, forming key strategic partnerships with industry, social service and workforce development agencies, and state leaders was critical to employing successful career pathways models. State support – and increased

funding – helped community colleges build capacity, align systems, and increase scale of programs.

Noting the financial constraints of individual schools and states, national philanthropic foundations became involved and financially supported this large-systems work. These included the Ford, Joyce, Kresge, Lumina, and the Bill and Melinda Gates Foundations, and, many others. The passage of the 2014 Workforce Investment Opportunity Act also further supported the work of career pathways, mandating that developing these pathways was now a local Board function (WIOA Guide, 3). Also important were requiring the community or technical college membership on the local Board as well as moving from a job-first approach to that of emphasizing the importance of obtaining a “recognized postsecondary credential” (WIOA guide 2).

The work of the national foundations and states willing to experiment with how to best develop programming to make large-scale movement helped seed the *Alliance for Quality Career Pathways* framework, a joint effort of ten states and the Center for Law and Social Policy (CLASP). Their work is seminal because it set the national standard for what a career pathway was and wasn't. It argued that a true career pathway could only be labeled as such when it included four essential functions. These functions all centered on ensuring participants have the support and connections to services and work experiences they need to move into progressively improved work situations. More specifically, they indicated that: education and training should be offered around participant needs and convenience (evenings, weekends, etc.); it should offer consistent and non-duplicative assessments, especially when working across agencies; it should provide wrap-around support services and career navigation services; and finally, it should provide for work experiences (Alliance, 14).

The motivation for developing this framework was to provide consistent definitions and conceptual models for career pathway systems and programs at both the local and state level; to provide criteria, indicators and requisites for strong, sustainable, and effective career pathways systems; and, to define measures and metrics that will allow for accurate reporting on outcomes and continuous improvement (Alliance, 8). The consistency across pathways systems would allow for a shared language and understanding that would help develop a shared vision and increase buy-in and cooperation from partners (colleges, workforce development boards, the legislature, social service agencies, employers and industry sectors, etc.). A pathway system, then, is an overarching framework in which these partners work collaboratively (Alliance, 15). Consistency is especially important as pathways participants move through the different systems, organizations, and funding streams, all of which may have different metrics for outcomes and success. The appeal to instituting Alliance metrics (AQCP) is that they “provide a cross-system view of results and...support shared accountability and improvement among partners” (Alliance, 27). Using a “common language” and measuring system would make progression through a career pathway much clearer as the goal line would stay constant versus changing with each funding stream, partner, and their corresponding (different) requisites.

Critical to a state quality pathway system are five criteria and they all deal with fostering an environment at the highest level that supports and rewards collaboration: commit to a shared vision and strategy; engage employers and include sector strategy principles which elevate employers to partners in creating viable pathways, not simply customers; collaborate to leverage resources; develop and implement supportive state policy; and develop, use, and share data and measures to engage in continuous improvement.

As important as this work is, there is little to no literature on how effective this framework has been to move people into continually improving work situations or to allow for increased educational attainment levels. The review work that has been conducted has been done hand in hand with PBF studies as performance outcomes is the lens through which this work is seen as being successful or not (e.g., Hillman, Tandberg, Hicklin Fryar, et al.). Noting the observation of Michael Bastedo in *Sticky Mechanisms*, it takes time for these events to unfold.

That does not mean movement should not be made and in fact, fostering a supportive, collaborative environment of all partners would only lead, hopefully, to positive spillover effects. It *may* mean a re-aligning of resources, a move that two-year colleges would welcome to allow them the resources they need to truly serve nearly half of the country's undergraduate students.³⁴ Their organization is explored in the next section.

Characteristics of Community Colleges...Do They Help or Hinder Credential Completion?

Thomas Bailey, et al. (2005) examined how the characteristics of community colleges affect the success of its students in completing associate degrees. The study found that: graduation rates decrease as institution size increases; higher part-time to full-time faculty rates have a negative effect on graduation rates; a greater emphasis on occupational training or workforce development lowers graduation rates; colleges with a larger share of minority students have a lower graduation rate; and lastly, individual characteristics are far more strongly related to completion outcomes than institutional factors (Bailey, et al. 2005, 24-27).

³⁴ The Community College Research Center at Columbia University, citing the 2016 College Board report on trends in community colleges, notes that "42 percent of all undergraduate students attended community colleges."

In Bailey's (et al.) 2015 book *Redesigning America's Community Colleges*, he notes that the current cafeteria model of community colleges, whereby students can pick and choose as they please from classes, programs, or services without really understanding how these will move them toward their goal, is based on the mission of access. Students were allowed the opportunity to explore freely. However, this led, more times than not, to students having little understanding of what they were working toward and so many of them stop attending school. The initiatives that have been implemented to help students make progress – such as first year experiences or cohort-based learning communities, One-Stop centers, contextualized adult basic education instruction, bridge programming, mainstreaming developmental and credit-based courses – have been good first steps. But they haven't been *enough*. These efforts are often small in scale and they are not distributed over the entire structure of operations (Redesigning, 218). Because of their limited scope and isolation, their impact has been limited.

Rather, to make the sort of change at this level will take a re-imaging of two year colleges where human resources are the first investment: professional advisors to help *all* students develop and monitor a personalized education plan; faculty who have been trained on *how* to teach and help students carry, apply and expand on those key sets of skills that help them be successful in the classroom (and outside the classroom); administrators who can help provide the strategic operational structure and vision to lead faculty and staff to change how they view their work and create processes that help move students, not create barriers. This would need to be accompanied by state policies that allow for a clearer transfer pathway between community colleges and its state universities. And, of course, this cannot happen without the very industries (who will hire these graduates) at the table willing to partner to make these changes. Lastly, the

federal government would need to change federal financial aid – how it is appropriated to schools, how much is available, and how students are able to tap into this source of funding.

The conversation around getting this right is made more urgent, perhaps, by the extreme bifurcation of the American social economic classes, split along income and racial lines, which is explored in the next section.

Poverty and the Wisconsin Experience

With more wealth being concentrated in less hands and social mobility decreasing, a larger share of Americans are being left behind. Prompted by outcomes based funding, institutions, particularly community colleges, have been turning to developing career pathways to provide systemic solutions to address these pressing needs, in career clusters – information technology, health, advanced manufacturing, etc.

Colleges and partners are to be commended for their work on this. However, state policies of inclusion need to also shift to allow for real, sustained, and greater participation of all its population. For example, undocumented students, many of whom were raised in this country and brought here as children through no fault of their own, do not benefit from federal grants, programs or financial aid because they are not eligible; they often are excluded from in-state tuition rates even if they lived most of their life in those states. Those who may have been incarcerated may not qualify for certain jobs – especially those in the high-demand, high-wage areas like healthcare or financial services where the crimes they committed (often) as young men or women leave them permanently excluded from consideration by law. Many times, employers simply will not hire them because they are seen as a liability. These examples are particularly

true for Wisconsin. In-state tuition for undocumented students was rescinded by the current state administration. The state (followed closely by Iowa, and other Midwest states, especially those who had sizeable manufacturing industries prior to the 1980s), has the dubious honor of being the most hazardous state for African Americans, especially men and children, who experience incarceration and poverty, respectively, at significantly disproportionate rates than other racial and ethnic groups.³⁵

Laura Dresser and Joel Rogers from the Center on Wisconsin Strategy through *The State of Working Wisconsin* “take the temperature” on jobs and families in Wisconsin. In 2015, the authors report that: Wisconsin lags the country in job growth, 27% of the State’s workforce holds poverty wage jobs; the poverty rate for children has nearly doubled since 2001; and, wages have not grown too much – over the last 35 years, wages have gone up \$0.71, even as housing, food and other costs have significantly increased.

Highlighting again the connection between education, employment and wages, those with a bachelor’s degree or higher had the lowest unemployment rate (3.2%). Those with less than a high school degree experienced unemployment rates of 14.9%. Compared to a white unemployment rate of 4.3%, Hispanics experience unemployment at 9.1% and Blacks a staggering 19.9%. Poverty wages in 2014 were less than \$11.55 per hour (Working Wisconsin, 8-9); 25% of White workers, 36% of Black workers, and 48% of Hispanic workers earn poverty wages. In the state, children’s poverty rates have double to 43% from 2001 levels. Clearly, in Wisconsin, the recovery from the Great Recession has been slow.

³⁵ Incarceration rates for Black males in Wisconsin is 12.8%; the U.S. average is 6.7%. Black children experience poverty at a rate of 36.3%; the U.S. rate is 25.8%. *Wisconsin’s Mass Incarceration of AA Males: Workforce Challenges for 2013*. irp.wisc.edu/faqs/faq4.htm. Web.

As noted in Robert Putnam's latest book and echoed by Maureen Conway from the Aspen Institute, adults' poverty wages profoundly impact development (both children's and adults'), making physical, mental and intellectual growth more difficult, leading to less success in school. With less educational attainment, it makes climbing out of poverty even more difficult.

As Goldin and Katz indicated in their 2007 article, "The majority of the large increase in wage inequality since 1980 is accounted for by expanded educational wage differentials dominated by sharply increased returns to postsecondary schooling" (2007, 160). According to the 2012 OECD *Education at a Glance Report*, for men in particular, the returns on completing tertiary education in the United States is higher than in most countries of the world (putting the U.S. in 7th place out of 32 countries), as is the penalty for not completing high school (putting the U.S. in 31st place out of 32 countries for the highest wage penalty) (OECD, 12). See Appendix D for a summary of findings on other related measures, including graduation rates, level of education among age groups, and public and private expenditures on education in comparison with other OECD countries.

Goldin and Katz, the OECD, and Robert Putnam, all indicate that in order for this country to move from wage polarization, educational returns polarization, and to shore up the middle, the country has to be brought back to a *shared* prosperity and that this can be done through an investment in education. Goldin and Katz: *Expanding the educational attainment of U.S youth requires increasing the college readiness of children from poor and disadvantaged backgrounds and ensuring that the college-ready have access to financial support for their higher education* (2007, 161). From OECD: *One way countries can increase higher education attainment is by establishing a level playing field – for example, by working to assure that young people from educationally-disadvantaged backgrounds have a fair chance at entering higher education. In*

every OECD country, the odds that a 20-34 year-old will attend higher education increase with the educational attainment level of his or her parents (2). Robert Putnam: The lens to view this problem is not purely “red” (conservative values), which cites the collapse of family as the main problem nor “blue” (liberal), which cites the collapse of economy, but rather “purple” – a both/and. Poor and working poor families are unstable in terms of work opportunities, housing, and family structure. These immediate needs make it difficult to concentrate on higher order concerns such as postsecondary education, preventing them from reaping the benefits of a new economy based on knowledge, technology and education beyond high school. In fact, there is now such a high correlation between the level of education one has and income earned, it’s now possible to measure social class based on educational attainment levels.

It is against this very complicated, interwoven story that a short-term certificate in manufacturing essentials is examined in the context of a case study.

CHAPTER 3

A CASE STUDY SURVEY METHODOLOGY & ANALYSIS

Amidst generally declining financial support for public institutions of higher education (IHEs) and with the rise of performance based funding (PBF) models as a means to affect the work of IHEs by shifting their focus from access to completion rates, IHEs have responded, at varying levels, by maximizing their ability to fulfill these requirements for funding.

Community and technical colleges in particular have been in the spotlight as these trends have gained popularity. Largely, this interest in two-year schools is centered around the promise in the potential impact: these schools educate the most Americans; the students who attend these schools are, on average, first-generation, older, non-white, not as prepared as those who attend four-year institutions, and poorer. These schools have historically been tasked as the nation's workforce developers. Moreover, given that many schools are open access, the deliberate guidance of students through completion of long-term or associate degrees presents a competing mission. This is due, in part, to the nature of the student who attends – on a part-time basis, under the demands of work and family life, with often a need for some remedial work. But, the pushback on these institutions through PBF has been to encourage them to develop creative solutions, in partnership with other interested parties, to increase completion rates of its students and shift the focus from access to completion.

To the extent that PBF has been successful in moving the needle on completion rates at the two-year level, however, is mixed at best. The lure of the promise to successfully move people who have normally not fully participated to completion of long-term and associate degree programs has revolutionized the manner in which IHEs, along with workforce development

organizations, state and federal government, industry, national foundations, and policy makers (at all levels) have partnered in an attempt to create opportunities to address this shift in focus.

Several studies have indicated that the type of programming that has seen an increase in both offerings and completion rates is the short-term (less than one-year) certificate. Along with the interest in short-term training is the current trend to chunk out, modularize, or create embedded credentials as part of career pathways that are clear, focused, leave little room for options, and lead to an eventual completion of a longer-term program and, increasingly, positive workforce outcomes. These short trainings, in essence, stack on each other as they lead the student down a particular pathway.

Further, as PBF performance measures encourage IHEs to address the needs of adult basic education students, the measures incentivize transition from developmental, basic adult education, or English as a Second Language placement to enrolling in credit-based or occupational programs. Often termed “bridge programming,” offerings are often combined credit-based occupational training and additional support courses in critical areas such as mathematics or reading. For Wisconsin, this measure is found in PBF criteria #5. The statutory language reads: *The number of adult students served by basic education courses, adult high school or English language learning courses, or courses that combine basic skills and occupational training as a means of expediting basic skills remediation, and the success rate of adult students completing such courses* (Formula for Allocating WTCS Performance Funding, June, 2014).

Rationale for a Case Study Approach

The goal of this study is to add to the richness of the research currently available on this incredibly complex topic. Much of the work that has been done to-date on PBF and completion has been carried out at the state level, often considering both two- and four-year institutions within the same data set. The experiences, needs, expectations, and missions differ greatly for these types of institutions and those nuances can be missed or diminished in the larger, aggregate studies completed thus far.

A case study approach allows for a more thorough investigation and analysis of a problem. As related in the opening pages of this work, there is a strong temptation to reduce problems and issues to soundbites. But in this case, the issues, responses, consequences and future efforts contributing factors can easily get confused so that one does not recognize if it's a cause or an effect or an externality. This approach allows for a cross-systems investigation to find the roots of the problem so that any recommendations for future research can more accurately reflect the experiences, needs, expectations, and missions of public higher education institutions.

On the manufacturing essentials short-term certificate

The manufacturing essentials short-term certificate – the focus of this case study - is an example of bridge programming. Because bridge programming requires IHEs to work across areas that typically have not truly worked together (credit versus noncredit, career and technical versus general or developmental education), this type of work presents real challenges and

requires creative and committed solutions on the part of faculty, administration, and more so the state oversight systems (including the legislature) to being successful *and* sustainable.

The question this work strives to answer is whether this short-term certificate in manufacturing essentials has helped students become more successful as a student or as an employee. Has it facilitated faculty cooperation in reaching beyond their own scope of expertise? Have administrators found a way to adequately sustain these types of offerings beyond grant opportunities? How have two-year schools met the needs of industry in response to the “skills gaps” that have been identified, especially in the manufacturing industry, which has been an ardent supporter of PBF and career pathways?

This case study utilizes surveys of the various players in this particular bridge programming effort - students, faculty and support staff, administrators, and to some extent, employers – to attempt to arrive at the point where we understand, on a micro level, whether the larger, macro-level observations hold true for this program, which have indicated that the employment impact has been minimal and that there have been limited opportunities for students to continue in schooling or advancing in their work.³⁶

³⁶ Findings from other studies indicate that there is not much market value in short-term certificates save some targeted areas like protective services. Certificates of a longer nature (those lasting a year or more) tend to have the highest wage returns. See the work of Mina Dadgar and Madeline Joy Weiss from Columbia University in their 2012 presentation on labor market returns to community college credentials: ccrc.tc.columbia.edu/media/k2/attachments/labor-market-returns-pay.pdf and, Georgetown University’s Center on Education and the Workforce report *Certificates: Gateway to Gainful Employment and College Degrees*: cew.georgetown.edu/wp-content/uploads/2014/11/Certificates.ExecutiveSummary.071712.pdf.

Method

Utilizing SurveyMonkey (Gold version) as the survey deployment and analysis tool, survey instruments were built for each target group in this case study: students, staff and faculty, and college administrators. To aid in assuring a reasonable return rate – at least 20% of each group, the survey was distributed electronically and follow up was conducted via the telephone to meet the goal of a 20% response, if needed. Samples of each survey are found in Appendices B-D. IRB approval for the project is found in Appendix F.

Confidentiality

All participants were asked for informed consent as part of this work. No identifying information was used in the analysis and all participants were assured confidentiality. Survey participants were compensated for their time in completing the survey in the form of a Starbucks gift card for \$10, an amount whereby there was no undue influence. All supporting information is stored in an online, secured Dropbox account.

About the Surveys

Students

There were a total of 204 students who had been enrolled into the manufacturing essentials classes that were associated with the short-term bridge certificate program. Of the 204 students, 75 were White, 38 were Black, 73 were Hispanic, 11 were Asian, 6 were bi-racial, and 1 was unknown. It is important to note that these ratios do not reflect the makeup of the college

where the predominant racial group is White (on average, slightly more than 70% of the student population), nor the historical make-up of the program where this certificate resides. Over the last four academic years (2012/13, 2013/14, 2014/15, and 2015/16), the program continues to be largely male (92.27% program students) and white (81.36% of program students).

A total of one hundred and ninety students had participated in the *full* grant-sponsored training, meaning they had applied to the certificate (there were those students who took only one or two classes for purposes of other than completing the Manufacturing Essentials certificate). However, even this group needed refining. The following were removed for the purposes of this study: those students whose academic records indicated they had not completed the certificate; those that had no contact information; and, those that withdrew from the *certificate* either by choice or circumstance (grades of withdrawn [Ws] or Fs).

Of the 190 students left from this group, 149 were sent the survey to both their official college email and, if on file, their personal email as well. The make-up of this group is as follows: 129 males and 20 females; there was representation from all racial and ethnic groups excluding Native Americans; and, with Hispanics being the largest group represented at 39% of the total students. See Table 2, which illustrates the gender and racial characteristics of the 149 students who were sent the survey.

Of those 149, all had completed the certificate even though 3 respondents indicated they had not. The survey, released in early July, resulted in 29 students responding to the survey. As expected with a very mobile population, originally captured contact information had changed, necessitating a re-send on the email invitation, and given the timing of the academic year, it was done at the start of the fall semester in the last week of August. This resulted in a total of 39 students responding to the survey and four of these were incomplete. Calls were placed to these

students to assure completion of the survey but in all cases, phone calls were not answered. A total of 35 students completed the survey and inform this work.

Table 2. Sex and Racial Characteristics of Group

N=149 Total Students			
Sex	Race/Ethnicity	n	% of Total Group of Students (n/149)
129 Males (87% of students)	White	40	27%
	Asian	9	6%
	Black	28	19%
	Hispanic	47	32%
	Multiracial	5	3%
20 Females (13% of students)	White	6	4%
	Asian	0	0%
	Black	3	2%
	Hispanic	10	7%
	Multiracial	1	.006%
		N=149	100.006% – due to rounding

The student survey focused on the student's experience in the certificate program as it relates to instruction and additional support. The inability to link unemployment data to each student is a limitation to this survey. Therefore, the questions related to employment are meant to triangulate the effects that completion of this certificate may have had on employment earnings and outcomes.

Faculty and staff

All the faculty and staff who worked with this group of students were asked to complete the faculty and staff survey. Faculty represented the technical, general studies, and developmental areas. Staff represented those who supported the activities of the grant including program advisors (degree or credit students), transitional advisors (non-degree students), WIOA staff, grants office staff, and data support staff. In all, 49 faculty and staff were sent the survey: 42 were faculty and 7 were support staff. Nearly all faculty and staff were located at the main

campus, which has recently invested in a significant upgrade to manufacturing facilities. Of these 26 total faculty and staff responded; nineteen were faculty and seven were staff.

There are nearly 500 full time faculty and nearly 1500 part time faculty at the college, a 1:3 ratio of full time to part time faculty. Most likely because this was a grant-funded project, 25 of the faculty who participated in the grant were full-time and 17 were part-time, a 1.5:1 ratio. The staff were nearly all full time except for one part time employee.

The manufacturing area (including machine tool, welding, and manufacturing engineering) was represented by eighteen full time faculty. Twenty-one of the faculty came from the general education areas including math, communications, and student success. In these areas, there were only seven full time faculty and the remaining fourteen were part-time.

Historically, there has been a tendency, especially in occupational, general studies, and developmental areas, to silo into respective areas of instruction and student categorization for delivering student services (i.e., a credit program advisor would not see a non-degree or non-program student). In fact, this has been identified as one of the challenges of integrating developmental and credit-based level work through bridge programming. The questions on the faculty and staff survey focused on how well these groups of instructors and staff, who have typically worked without a need to align their curriculum or have an understanding of how their respective curricula or areas scaffold and build on each other, were able to come together around shared outcomes within an organization whose infrastructure does not readily support this type of cross-boundary work. What recommendations would they have for the institution as it moves further along in this work?

Administrators

The survey for administrators was deployed to those directly and indirectly involved in this bridge programming work. Recipients included those who championed the work of the bridge programming in the manufacturing essentials program as well as top-level administrators who are responsible for the performance of the institution. In all, fourteen administrators were sent the survey. Of the three type of employee groups at the college (faculty, support staff, and administrators), this is by far the smallest group, numbering nearly 100 full time employees at the College, so fourteen is not an unreasonable number. Sample titles include program and office directors, deans and associate deans, managers, and top level administration. The work of these positions is specialized, so the administrators represent very specific areas.

Of the fourteen administrators, three initially responded, meeting the desired 20% response rate. However, in order to gain a better understanding of their experiences, reminder phone calls were subsequently placed to encourage completion of the survey. In response to those phone calls, two administrators indicated that their involvement was very limited and they declined to participate, leaving the total number to 12. In all, six administrators responded.

The survey revolved around the challenges noted in the literature around the need for additional, sustained resources to provide the intense support work students need, as well as the aligning of curriculum in two unrelated areas. What was needed to develop these types of offerings? Did the central state office responsible for oversight need to provide any additional assistance to make these efforts work? Given that this work is a performance based funding measure for the college, administrators are expected to have data collected at the local level, packaged, and shared at the highest levels. Does the institution have the capacity to collect the

data? What other challenges or opportunities do college leaders see with the general direction of career pathways, modularized curricula and the completion agenda?

Employers/businesses/industry

This population was not directly surveyed as part of this work largely due in part, to the several outreach efforts various offices in the college have engaged in. For example, the College has recently undertaken a significant effort to re-visualize its academic planning process. The provost's office launched a major effort to connect with its employer stakeholders to understand their needs and how the college could better prepare its students to be their employees. This particular effort is notable because it reinforces the importance of core workforce skills and highlights the gaps that may exist. Data is based on responses from both Program Advisory Committees and Industry Surveys for a total of nearly 900 responses.³⁷

Additionally, as this training was offered under the auspices of a grant, data is also available from the employer survey conducted by the administrator responsible for grant outcomes at the college. The surveying carried out was being used to develop the most responsive manufacturing fabrication career pathways. As part of this inquiry, employers in three different areas (computer numerical control – CNC; machine operator; and general fabrication) were asked to explain how likely they would hire someone with the Manufacturing Essentials credential from the college.

Their responses will be explored and combined with the provost's work, the hope is that the critical connection between industry and education will be supported. According to

³⁷ Bakken, Turina, and Timothy Casper. "Monitoring Report: Board Ends 1.2.1: Community Leadership & 1.4: Communities." Madison Area Technical College Board of Trustees Meeting, Madison. 10 June 2015. Web. 19 Apr. 2016. <<http://madisoncollege.edu/files/users/ehustad/MonitoringReport%234.June2015.pdf>>.

Georgetown’s Public Policy Institute Center on Education and the Workforce, in their 2012 report, “Career and Technical Education: Five Ways that Pay Along the Way to a BA,” they truly have no choice:

The American postsecondary CTE system is unique, flexible, and underutilized... Employers play a crucial role in this system that is often underappreciated and underemphasized...The success of postsecondary CTE relies on the connections and partnerships between public and private institutions that promote workforce preparation: Both are necessary, but neither is sufficient. (39)

Analysis

Using the statistical and analytical tools available in SurveyMonkey, the findings are explored to gain a better understanding of whether this short-term certificate is an effective tool for addressing the “skills gap” in workforce preparation and career or continued educational pathway completion. Some of the questions provided the opportunity to select more than one answer. Therefore, not all percentages add up to 100%.

Even though there are certainly limitations to the data – most importantly the inability to tie unemployment (wage) information to program participants and the ability to track students longitudinally through Integrated Post-Secondary Education Data System (IPEDS), the goal is to gain a richer, more textured understanding of the student, support faculty and staff, and administrators’ experiences as they work to completion. Therefore, a descriptive analysis will be employed. The next section details the findings to the respective survey instruments.

CHAPTER 4

FINDINGS

This chapter focuses on the findings of the three respective surveys deployed to learn more about the student's, faculty and staff's, and administrator's experience with the manufacturing essentials short-term bridge program. While businesses were not surveyed as part of this case study, data is included from other surveying efforts deployed at the college, particularly those that feature manufacturers.

StudentsBackground

A total of 39 students responded to the survey and four of these were incomplete, leaving 35 useable survey responses. It is these responses that inform this section. In review, bridge programming brings together developmental or adult basic educational programming with career and technical education. Bridge programming is designed especially to move minority students and those with low SES from predominantly non-degree programming to credit-cased programming. Transitional specialists/advisors recruit and case-manage bridge program participants. Each specialist or advisor is assigned responsibility over a specific bridge program (other programs exist at this institution including nursing assistant, biotechnology technician, and electronics) and follows students through to completion and connects them with other resources in the college and in the community to move them onto the next phase of their schooling or work.

Of the thirty-five respondents, 30 were males and 5 were females, 86% and 14%, respectively. This return rate nearly perfectly mirrors the gender breakdown of the 149 total students who were sent the survey, which was an 87%/14% representation. Of course, the program data skew more heavily toward males at a 92%/8% breakdown.

The raw data was combined with demographic information so as to isolate responses based on gender, race, or age, which will be used to further illustrate the figures included here. Not all 35 students responded to each question; some skipped certain questions. Those numbers are adjusted accordingly in the findings.

Findings

Across the board, communication came up as a theme that weaved across different answers. For example, most students learned about the program from an advisor. See Figure 1.

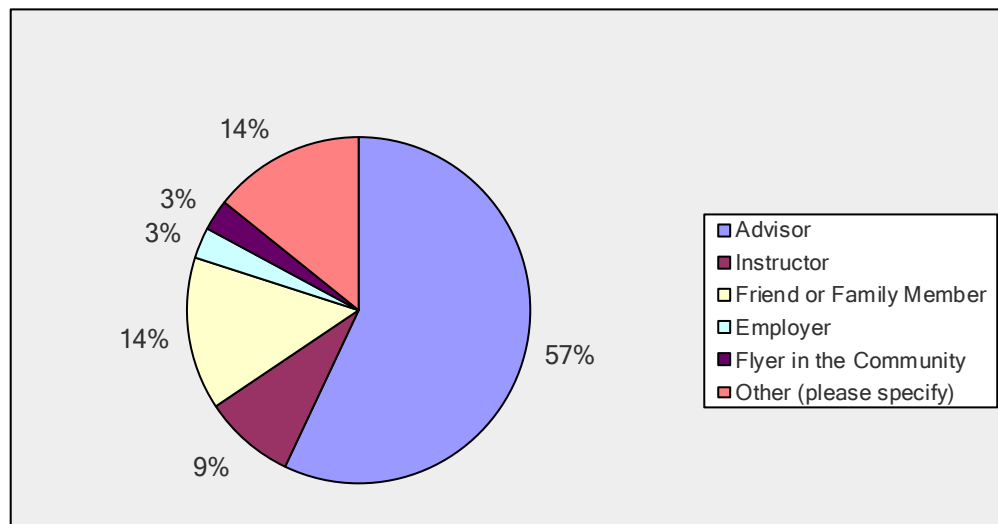


Figure 1. How did you learn about the Manufacturing Essentials certificate?

Interestingly, four of the students through the “other” category had learned about the certificate through the Job Center or Workforce Development Center, a critical partner in career pathways work. In all 34 of the 35 students learned of the program through a person. Only one learned of it through a flyer.

Students indicated that they were most interested in the certificate because their tuition and books were paid for under the auspices of the grant. Further, as 80% of the students indicated they were working either part-time or full-time, the class schedule (mostly evenings) was convenient, as was the location. Only 5 of the students, 14.3%, indicated they wanted to enroll in the certificate in order to get help with the classes they knew they would struggle with.

While there was representation of adult ages across the board, the largest group (37.1%) of students who indicated they had been out of a formal high school setting in this country was between 7-26 years, making the largest group of students adults between the ages of 25-44. The average of a student at the college is 28, so this is not unusual. The large number of immigrants represented was also significant, making up nearly 1/3 of the group (28.6%). Half of these immigrant students indicated Spanish was the language they used at home while two indicated French, one indicated Mandinka (a language of western Africa) and the other Farsi.

Most students indicated it was their goal to work full-time (74.3%) and it was more or less evenly split if they wanted to work in manufacturing or in another area. See Figure 2. Of those that identified a different area to work in, five of the 12 students indicated STEM areas such as engineering.

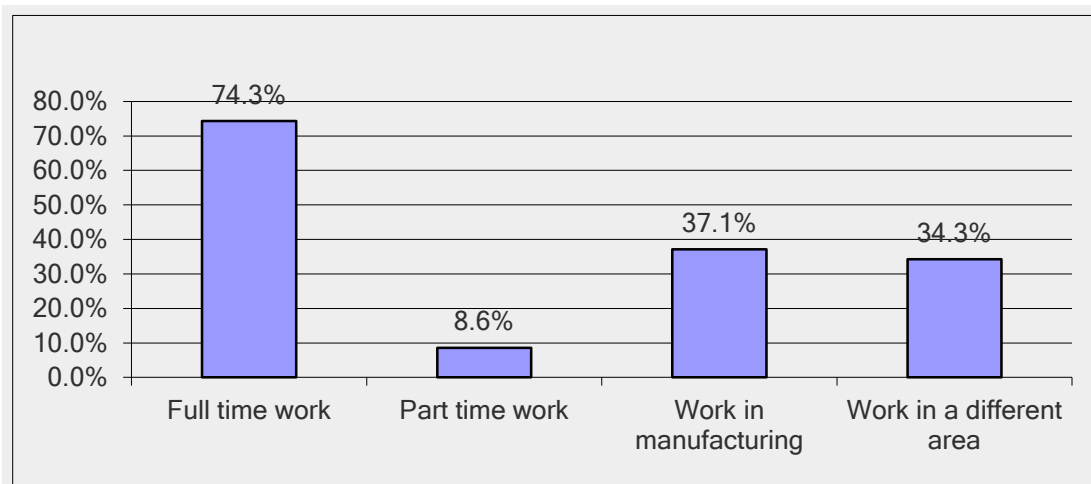


Figure 2. What are your future career goals?

Most of the students indicated they had goals of wanting to achieve an associate's degree (17 students or 48.6%). Some wanted to complete long-term certificates (6) and others equally wanted a bachelor's, master's, or nothing more than the certificate (4, 4, 4).

Those that aspired to higher educational goals also aspired to work in the area of STEM, citing career areas such as robotics and automation, IT and computer programming, and electrical engineering (17 of the 29 respondents) as options.

Around the question of work, more than half of the respondents indicated they were able to find work in the area of manufacturing after the completion of the certificate. Nearly a third were not able to find work in the area of manufacturing and another handful were not interested in working in manufacturing after the completion of the certificate. See Figure 3.

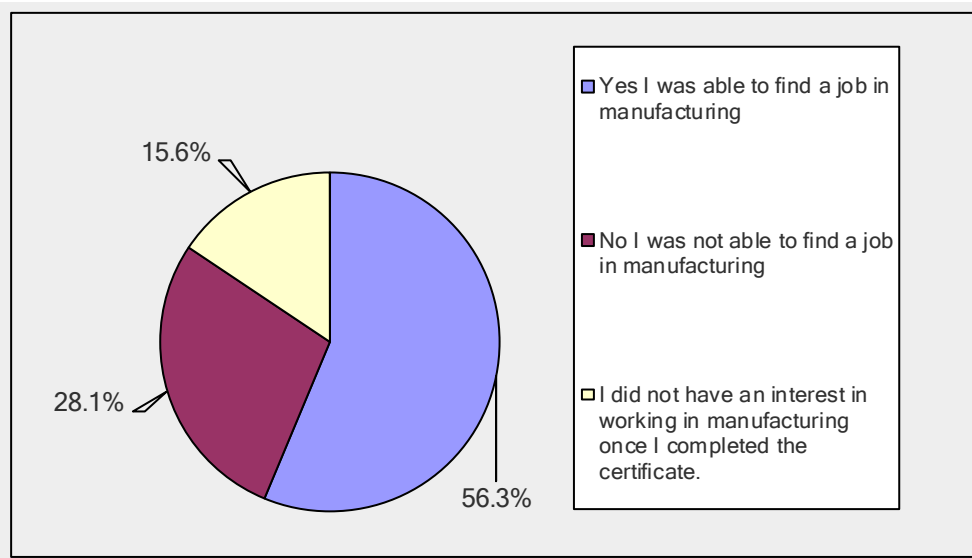


Figure 3. Were you able to find a job related to the area of manufacturing after completing the certificate program?

On skills

Most students indicated that the certificate helped them find employment in the area of manufacturing because it had helped them work on their communication skills (16 or 50% of respondents). They found this more helpful than networking with employers through job fairs (8 or 25%), refreshing their technical skills (11 or 34.4%) or even providing training in an area that had jobs (11 or 34.4%).

In relationship to the skills the certificate was designed to teach, students felt most strongly that they learned the technical skills the best (in ranked order): manufacturing processes and practices (90.6%), safety practices (87.5%), and how to read blue prints and technical documents (84.4%). Interestingly, communication bottomed out the list at 65.6% as well as math

skills (68.8%), even though they recognized that improving their communication skills helped them find employment.

Students wished they had learned more about how to operate gas metal arc welding equipment (17 or 53.1%) as well as how to better use tools such as lathes, power saws and drills (11 or 34.4%). Other students indicated they wished they'd had more time to spend on CNC or computer numerical control manufacturing.

Students found their instructors, both those in CTE and bridge/basic skills, to be very helpful or helpful, with the bridge instructors being *slightly* more helpful. While the number of CTE faculty varied depending on the subject matter being taught, by and large, the same three or four bridge faculty followed the students through the progression of the certificate. Students generally found that all instructors had high or very high expectations of them (14 and 10, 43.8 and 31.3%).

Nearly 88% of the students who responded to the question regarding how well the certificate prepared them in the non-cognitive skills of being on time, attending classes and working hard, indicated the certificate helped them prepare well or very well. See Figure 4.

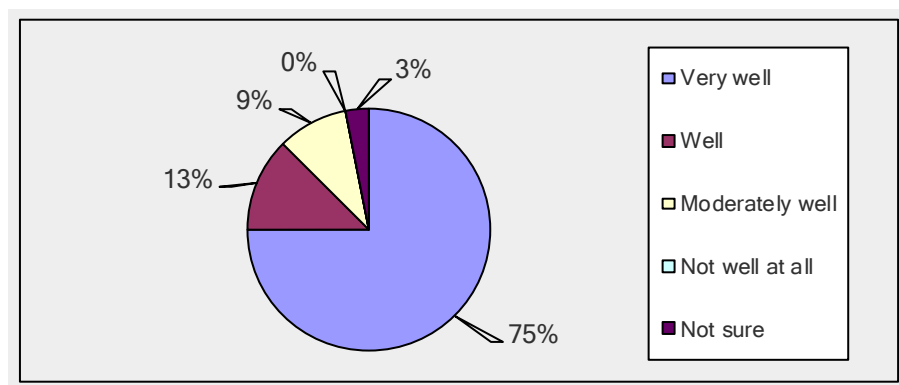


Figure 4. How well did the certificate program prepare you to be timely, attend your classes as required, and work hard?

In learning more about the demands placed on the students, several questions were asked about employment, caregiving and other hardships that can affect enrollment or progress in an academic program. See figure 5.

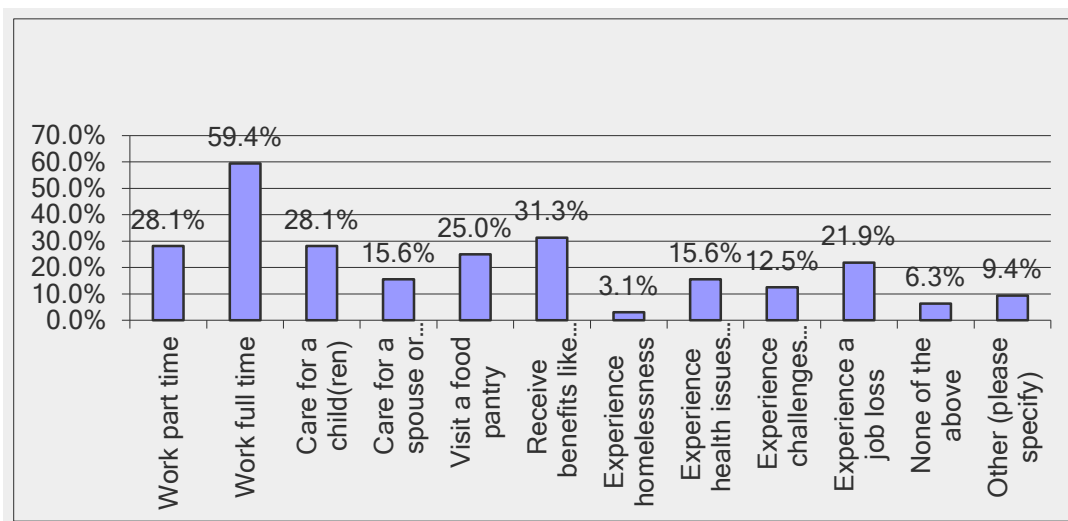


Figure 5. Demands and hardships students experienced while enrolled in certificate

Nearly 60% of the students who responded to this question worked full time while attending school. Another 10 students, 31.3%, indicated they received public benefits like foodshare or BadgerCare (Medicaid), means-tested programs. Further, these ten students also indicated they worked full time (4), cared for a child(ren) (5) or a spouse or parent (2), visited a food pantry (5), and experienced health issues (4).

Few students were able to take advantage of student engagement opportunities: two (6.3%) volunteered with the student life office, two worked on campus as student employees. And one participated in a college mentoring program. More students, five (15.6%), participated in one-time student life events on campus like campus fun days. However, a larger majority of

students turned to each other as resources for studying, with 22 students, 68.8%, indicating they studied with a classmate while 15 (46.9%) studied at the library and a smaller number studied with an instructor (7 or 21.9%) or a tutor (4, 12.5%).

Half of the students reported that the intensity of the program was the most difficult (the classes were scheduled to mimic a job schedule – full days or long evenings). A third of the students also reported that the rigor of the work was difficult (10 students, 31.3 %). See figure 6.

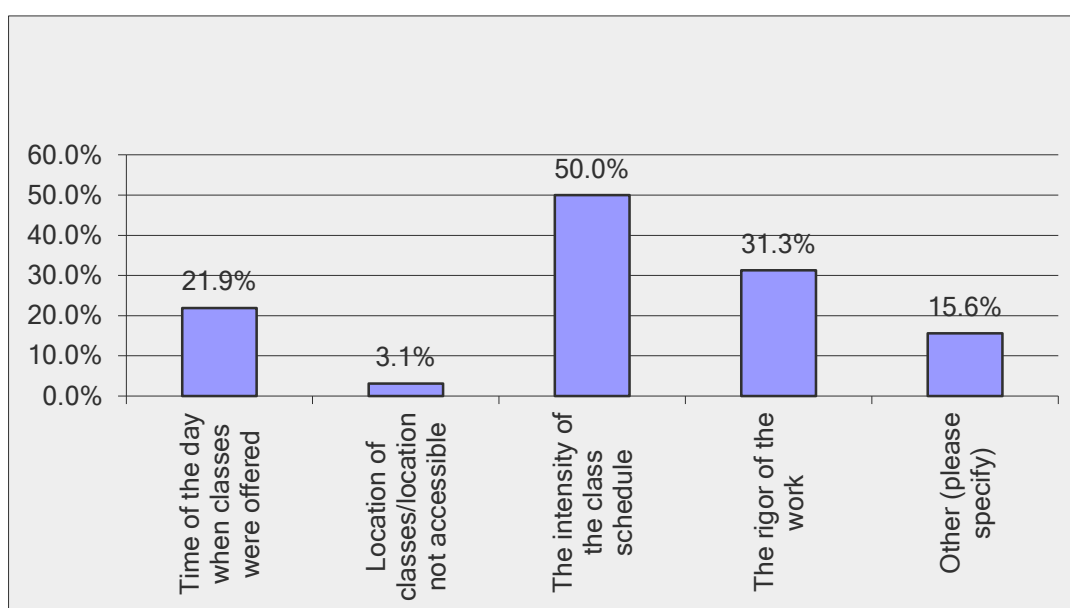


Figure 6. What students found to be the most difficult about the program.

By far, respondents indicated they most enjoyed the learning aspect of the program with 84.4% stating that they enjoyed learning new skills as equally well as enjoying the instructors. The social aspect of the experience was also referenced with 68.8% indicating they enjoyed being in school and meeting new people, respectively. Lastly, they enjoyed the staff (62.5%) and

the challenging nature of the work (59.4%). The class schedule and ability to connect with employers were cited the least favorably (selected by 25% of the respondents).

Of the students who responded to the question on employment status upon entering the certificate, only 6, or 18.8%, indicated they had not been employed upon starting the program. The remaining students worked either full time (19 students) or part time (8). Thirteen of the students who worked indicated they worked in manufacturing.

Of the twenty-seven students who indicated they had worked upon entry into the program, 18 or 66.7%, of these indicated they remained with the same employer *after* completing the certificate. Further, of these 18 students who remained with the same employer post completion, 14 or 77.8% of these did not see a change in rate of pay per hour nor job, they are earning the same rate of pay in the same position. None were promoted to different jobs. Three of the 18 experienced some change in pay (one went from part time to full time; another received a pay raise of more than \$1 per hour; and the third received a moderate raise in pay per hour of between \$0.50 and \$0.99). A fourth student moved from one area of the company to another but saw no change in wages. See figure 7.

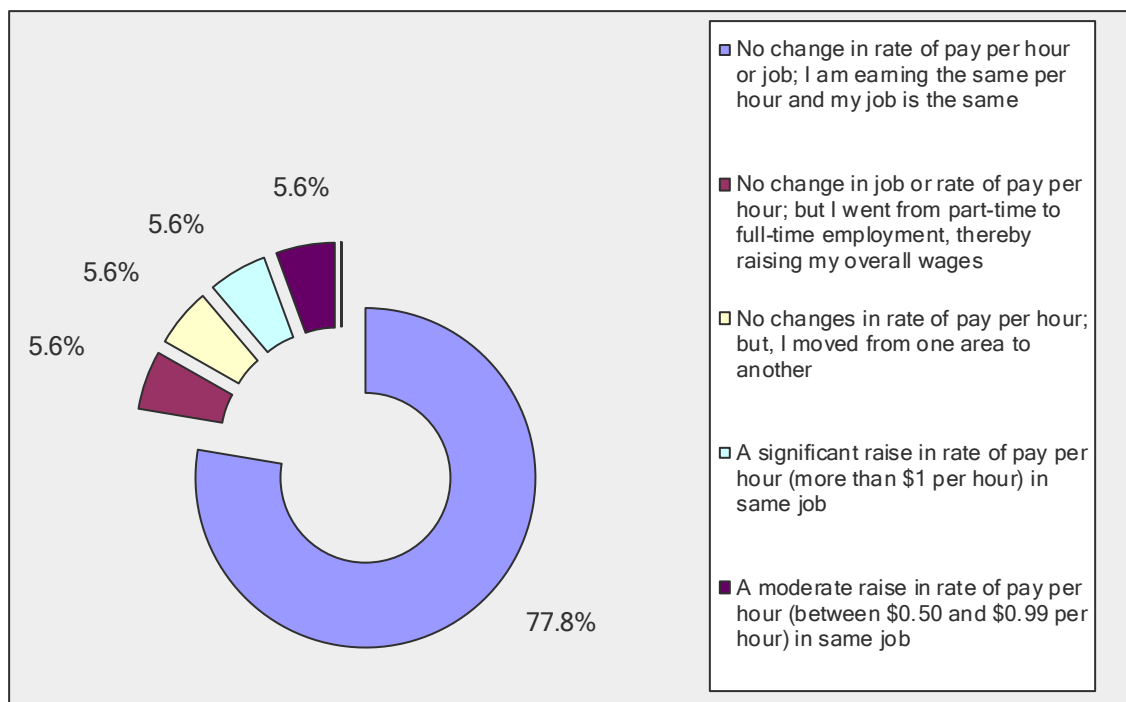


Figure 7. With same employer, how rate of pay per hour or employment status was affected by completing the program.

Nineteen students indicated they now have a different employer than when they started the certificate. These seemed to be the students that experienced a change in pay. Here, nine students (47.4%) indicated they received a significant raise in pay per hour of more than \$1. Other students reported a modest raise (3) and 7 received a slight raise in pay.

Finances play an important factor for the group with slightly more indicating they would not have completed the certificate if their books and tuition hadn't been paid versus those who have enrolled in the certificate regardless of financial assistance (14 would not have selected the program without financial assistance vs 13 who would have selected the program regardless).

Representation among the student respondents was more or less evenly split among those who were high school or equivalent graduates (12 students), those who had some college but no

degree (11) and those who were educated in another country (10). Only one student reported a bachelor's and another an associate degree.

Students were asked what their ideal field of study would be if they had no constraints. Many responses were in the STEM areas, others were in health care, still others in the service industry. Thirty three of the thirty five responses are categorized below. Two responses were not sufficiently clear to be able to categorize. See table 3.

Table 3. Respondents' ideal career interests, categorized by WTCS career clusters.

WTCS Career Clusters	Area/Interest	n
Agriculture, Food & Natural Resources		0
Architecture and Construction	3D Printing, Heating, Ventilation & Air Conditioning (HVAC), civil engineering	5
Arts, A/V Technology & Communications	Art	1
Business Management & Administration		0
Education & Training		0
Finance	Banking/Real Estate	1
Government & Public Administration	Politician	1
Health Science	Nursing	1
Hospitality & Tourism	Culinary	1
Human Services	Children's Counselor	1
Information Technology	Programming	2
Law, Public Safety, Corrections & Security		0
Manufacturing	Robotics & Automation, Industrial Maintenance, Machine Operator, PLC Motor Controls	8
Marketing		0
Science, Technology, Engineering & Mathematics	Engineering (electrical, mechanical)	10
Transportation, Distribution & Logistics	Diesel Technology, Automotive Mechanic	2

A great majority of the students indicated the certificate had been very helpful in boosting their confidence that they could do college-level work (26 or 74.3%). And in fact, 28 or 80%, reported they had since continued on for additional education.

Continuing on for more education, a comparison

Understanding that students who responded to the survey were those who were most likely either interested in the topic or had maintained a connection to the college, an attempt to more fully understand how the respondents compared to the larger group of students on the question of continuing on for additional education was important to investigate and central to this case study. Of the 149 total grant participants, an astounding 118 or 79% of the students continued on for additional education at this institution, two of which enrolled in ESL classes.³⁸

However, 31 of the 118 students or 26%, stopped out without completing an additional credential. These students typically withdrew prior to the start of the following term and had mostly successful course completions. These were mostly males (29 of the 31); two were female. Racial representation was largely Hispanic (13 students or 42%), Black (8 students, 26%), White (7 students, 23%), 2 Multi-Racial students (6%), and 1 Asian (3%). These students, if career pathways models hold out, should be able to re-enter the system and continue on where they had left off. Time will tell if this will actually hold. See table 4.

Table 4. Students who stopped or jobbed out after continuing on past the certificate but fell short of another credential

Total Students Who Stopped or Jobbed Out	n=31, 26% (N=118)
Male Students	29, 94%
Female Students	2, 6%
White Students	7, 23%
Hispanic Students	13, 42%
Black Students	8, 26%
Asian Students	1, 3%
Multi-racial Students	2, 6%

³⁸ This number is significant. In comparison, students enrolled in two cohorts of the Construction & Remodeling Certificate Bridge (25 students), ten or 40%, completed the certificate. This certificate is not grant funded and students, if needing aid, must apply to the one-year technical diploma so they can be eligible to apply for federal financial aid. This is in comparison to 73% of the grant funded manufacturing essentials certificate. Of these ten, 7 or 70%, continued on and are enrolled in the one year technical diploma in the fall 2016 semester. This is in comparison to 79% of the grant funded manufacturing essentials certificate.

Another 37 of the 118 students, or 31%, did not fare as well. While they continued on for additional education, they were much more limited in their success in ensuing course work. They typically dropped classes after the term start, and many earned grades of F or W. It seems that, generally, these students had a harder time completing programs for whatever reason. Some of them incurred fee holds for thousands of dollars. Four of these 37 students were female; 33 were male. Along racial lines, 12 were White (32%), 2 Asian (5%), 9 Black (24%), 13 Hispanic (35%), and 1 multiracial (3%). These students, should they return to the college, will face significant barriers in re-enrolling. See table 5.

Table 5. Students who had limited success post-credential and will face significant barriers upon re-entry to the college

Total Students Who Had Limited Success Post-Credential	n=37, 31% (N=118)
Male Students	33, 89%
Female Students	4, 11%
White Students	12, 32%
Hispanic Students	13, 35%
Black Students	9, 24%
Asian Students	2, 5%
Multi-racial Students	1, 3%

Of all the students that had progressed through the program, understanding that some students are still in process (i.e., not enough time has yet passed), only 10 students graduated from a one year technical diploma or longer. Of the ten, 9 were male and 1 was female. Along racial representation, 8 were White, 1 was Black, and 1 was Hispanic. Financial aid was important to completion for these students – 6 of the 10 received federal aid. Four had no record of receiving financial aid. See table 6.

Table 6. Students who continued on post-certificate and graduated from a one-year technical diploma or higher

Total Students Who Have Graduated with a One-Year Technical Diploma or Higher	n=10, 8% (N=118)
Male Students	9, 90%
Female Students	1, 10%
White Students	8, 80%
Hispanic Students	1, 10%
Black Students	1, 10%
Asian Students	0, 0%
Multi-racial Students	0, 0%

There were 31 students total, or 21%, that did not continue on beyond the manufacturing essentials certificate. The students were more of a mixed group. While there were still more males – 24 or 77% of this group – there were also a few more females who did not continue on, 7 or 23%. Racially, this group was also more representative with 12 Whites not continuing (39%), 13 Hispanics (42%), and 6 Blacks (19%). See table 7.

Table 7. Students who did not continue past the manufacturing essentials certificate

Total Students Who Did Not Continue Beyond the Manufacturing Essentials Certificate	n=31, 21% (N=149)
Male Students	24, 77%
Female Students	7, 23%
White Students	12, 39%
Hispanic Students	13, 42%
Black Students	6, 19%
Asian Students	0, 0%
Multi-racial Students	0, 0%

Excluding respondents

When the respondents were removed from the group, 114 total students remained. Here, 85 of the 114 continued on for education at this institution, or 75%. That's still a very strong

showing. Along gender lines, 76 were males and 9 females. Racially, the group was more mixed: 5 were Asian, 19 Blacks, 34 Hispanics, 4 Multi-Racial, and 23 Whites.

Again, similarly, 27 of the 114 students stopped out. They typically withdrew prior to the start of the following term and had mostly successful course completions. Two females, 25 males; 1 Asian, 7 Blacks, 12 Hispanics, 2 Multi-Racial, 5 Whites.

A larger group, 32 of the 114, continued on but with limited success. These students typically dropped after class term start and many earned grades of Fs and Ws. Some may have significant fee holds on their records. Three were females (all of color), 29 were males. Along racial lines, 2 were Asian, 6 were Black, 12 were Hispanic, 1 was Multi-Racial, and 11 White.

A significant amount of students, 29 or 25% of the group, did not continue on beyond the certificate. Along gender lines, most of them were males again (23) and 6 were female. Racially, this group was also more balanced. Five were Black, 13 Hispanic, and 11 were White.

Seven students graduated from a program of a year or longer. Six were male (86%), 1 was female (14%). Racially, one was Black (14%), 1 Hispanic (14%), and 5 were White (71%).

Respondents

The thirty-five respondents did over-represent on those continuing on for additional schooling – 33 or 94% of the group. Only two – 6% - indicated they had not gone on for additional schooling. Four (11%) of the thirty-five students stopped or jobbed out, meaning they left the college in good standing but without completing another credential more than the manufacturing essentials certificate. All were males, 2 were White, 1 was Black and 1 Hispanic. Three of the thirty-five students, 9%, graduated from a one year diploma or longer – and all were

white males. Twenty-one of the respondents were successfully enrolled in programs beyond the manufacturing essentials certificate. See table 8.

Table 8. Respondents' educational outcomes to-date

Respondents' Educational Outcomes	N=35
Respondents continuing on post manufacturing essentials certificate	33, 94%
Respondents who did not continue on past the certificate	2, 6%
Respondents stopping or jobbing out after starting post-certificate studies	4, 11%
Respondents who had limited success post-certificate (received grades of Fs and Ws)	5, 14%
Respondents who graduated from a one-year technical diploma or longer	3, 9%
Respondents who are currently enrolled post-certificate completion	21, 60%

Of the 21 respondents that successfully enrolled in studies post-certificate, 18 were in the school of applied science and technology. The three students outside of this area pursued nursing assistant and ESL classes. Demographically, 18 of those enrolled were males and three were females (all Hispanic). Five of the 21 respondents enrolled were White, nine were Hispanic, two were Black, four were Asian, and 1 was multiracial. See table 9.

Table 9. Racial demographics of respondents successfully enrolled post-certificate

Students successfully enrolled beyond the manufacturing essentials certificate	n=21 (N=35)
Male Students	18, 86%
Female Students	3, 14%
White Students	5, 24%
Hispanic Students	9, 43%
Black Students	2, 10%
Asian Students	4, 19%
Multi-racial Students	1, 5%

Faculty and Staff

The survey received a total of twenty six responses. Most of the respondents (19 or 73%) were faculty: 8 were full time faculty (30.8%) and eleven were part-time faculty (42.3%). Of the seven staff, two were full time support staff (7.7%), three staff (11.5%) indicated they were limited term or grant-funded employees, two others (7.7%) indicated they were a casual (this classification usually is a seasonal worker or works less than 520 hours in the calendar year) and another had experienced a promotion to an administrator since the work of the grant was done. See figure 8.

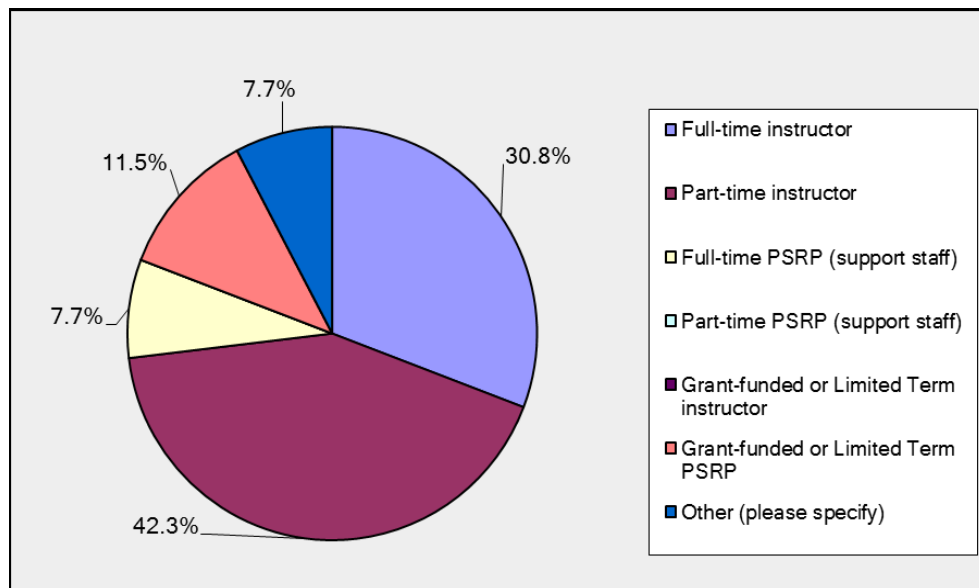


Figure 8. Job classification at college, outside of the grant

Many of the respondents indicated that the work they engaged in for this grant was not significantly different than their day-to-day work at the college. See figure 9. However, a number of the respondents were grant funded to either teach or support the grant: six indicated they were funded as instructors, and five as support staff. Of the ten staff that responded to the

question regarding fairness in compensation, 8 of the 10 (or 80%) indicated they had been appropriately compensated for their work in the program.

Because the work and role of faculty and support staff is different, the findings are reported as these two different groups.

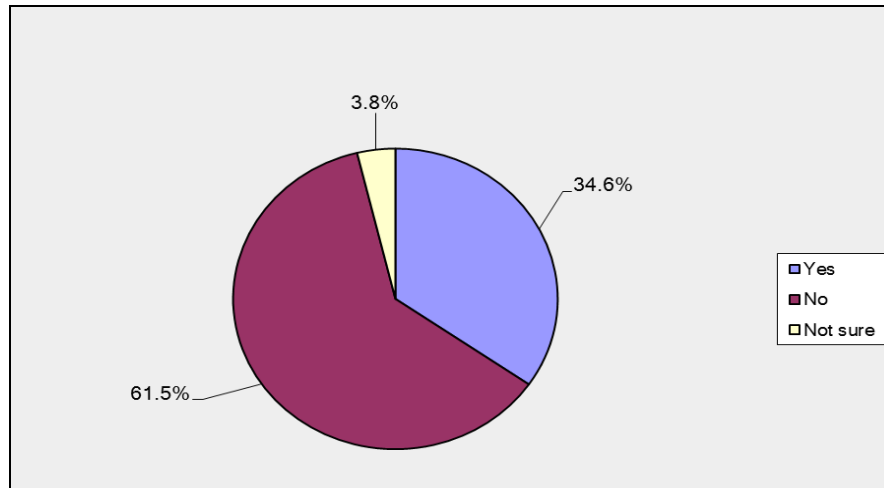


Figure 9. Was the role or work of staff and faculty different than regular role or work at college?

Faculty experience

Again, most of the respondents to the survey were faculty members (19 total). While eight of them were normally full-time faculty at the college, four were fully assigned to work for the grant. The others were limited term faculty (3) or taught for the grant part time (1). Of the part-time faculty, 11 normally worked as such for the college and for the grant, four were moved to limited term full time positions and seven remained as part-time faculty.

The remaining findings is based on the work faculty undertook for the grant *in support of the manufacturing certificate bridge programming* (i.e., not their normal role at the college).

Based on this categorization, eight of these faculty were part-time and eleven were full-time.

The eleven full-time faculty indicated that they mostly taught the occupational/technical education classes (8 or 73%) and two taught the support classes (18%). Eight indicated the work of the grant was not significantly different than the work they normally do for the college and three indicated it was different. These three indicated they had not received any special training or professional development. Most of the faculty (8 or 73%) indicated they would do bridge work again with no reservations. Of those that expressed some reservations, the issues ranged from broadening the scope of the pathway beyond manufacturing, to having more manufacturing skills added to the certificate, as well as math and communication skills, to the schedule not being convenient.

As could be expected, the role of faculty, besides teaching, was that of developing or adapting the curriculum either for the CTE classes or the support courses and writing the grant, while a couple indicated they collaborated with industry or employers to ensure their needs were represented in program development or arranged for student tours, co-ops, internships, or other work-like experiences.

Nine of the eleven faculty felt supported or very supported in their work by their supervisor or administrator. One felt somewhat supported and the other didn't know. Seven of the eleven faculty reported the partnering area was easy to work with and cited mutual respect for each person's expertise, good, consistent and constant communication, flexibility, support of staff, and working for the same goal as enhancing that cooperation. Three instructors were not

sure how easy the partnering area was to work with. One instructor indicated the partner was somewhat easy to work with and expressed concern that too much emphasis was made on skills that *support* manufacturing versus emphasizing skills to *do* manufacturing work.

A great majority of the faculty (8 or 73%) indicated that the bridge students were capable of doing college-level work and that the main contributors to this was the extra support class instruction (88%), the students' interest in the area (63%), and the cohort-based model of instruction (63%), and the low-risk environment (i.e., tuition was paid, additional instructional support, 50%). Other contributing factors, included case management of students (38%), a modified curriculum (25%), and lastly, the students' innate ability (13%). Two thought the bridge students were somewhat capable of doing college-level work and indicated that additional case management or counseling support for issues outside the classroom would have helped these students be more successful. Attendance was spotty and made it difficult to get through the material.

The same majority (8 or 73%) felt the certificate prepared students well for entry-level work in the manufacturing industry; three were not sure. Nearly all faculty (10 or 91%) indicated students were aware or very aware of the career trajectories available in manufacturing. Nine of the faculty indicated they saw students becoming confident or more confident in their ability to do college-level work. One indicated students become somewhat more confident and another was not sure. Nine faculty also indicated that the bridge programming model was effective or very effective in helping students feel welcome to the college. One thought the model was somewhat effective and the other was not sure.

When asked to provide any other information regarding the grant, instructors shared that they fully believed in the model, that it was a great experience, and that it was great to see "non-

traditional” students enter manufacturing programs. One faculty member indicated the bridge model was a far better model than others implemented at the college which are even shorter-term and not as supportive of students. Some faculty also expressed concerns with non-cognitive issues that affected classroom performance and would have liked to have seen more counseling available to students, others indicated that they would have wanted to replace a manufacturing survey course with a specific manufacturing skill such as metal fabrication or machining.

Staff experience

The staff’s work really centered around recruitment, advising and case-managing the student. Of the seven staff, three indicated the work they did for this grant was significantly different than the work they normally do for the college. One was not sure and three indicated it was not different from the work they normally do for the college. For those three who indicated the work was significantly different from the work they normally do, they indicated they did not receive any special training or professional development to carry out the work of the grant. One of the seven staff did receive professional development and attended a conference.

In response to whether they would do this bridge work again, all seven responded in the affirmative, with only one expressing some reservations citing the desire for separating the advising function from the recruitment function or to have more recruitment support. Only two staff indicated they assisted with the development of the program and that work centered around aligning college processes and systems to support the program. Four staff indicated they helped develop the employment component which was mainly student tours, organizing a career fair, and recruiting employers for the programming. Five of the staff generally felt supported or very supported by their in their work by their supervisor or administrator. Two staff, both advisors,

indicated they were somewhat or not supported in their work. While four of the staff indicated the partnering areas were easy or very easy to work with (three were not sure), one indicated there was a need to more clearly define roles and responsibilities. It seemed that consistent and frequent communication around programming and student/retention issues, creativity, willingness to try new things, allowing support staff in the classroom, and the CTE's interest in having bridge students in their programming, all served to enhance work between partnering areas.

Five of the seven staff (71%) felt that students were capable (4, 57%) or very capable (1, 14%) of doing college level work and that a cohort-based model (100%), interest in the career area (100%), case management (100%), support class instruction (80%), a low-risk environment (80%), and innate ability (60%) were the most cited factors that helped students do college-level work. Less cited were a modified curriculum (40%) and previous higher education experience (20%). One of the seven staff wasn't sure if students were or were not capable of doing college-level work. Another felt the students were somewhat capable of doing college-level work and indicated the students could have benefitted from additional support class instruction, case management, and more time in class.

Five of the seven staff (71%) indicated they thought the certificate prepared students well for entry-level work and that it helped students become aware or very aware of the career options in the area of manufacturing. The same number of staff indicated that students' became confident or more confident in their ability to do college-level work because of their ability to complete the certificate. Six of the staff (86%) indicated that the certificate was an effective or very effective model to help students feel welcomed at the college.

When asked if there was anything more they wished to share, comments included: alignment of the certificate curriculum from the beginning is important to reduce the extra time and work required to do it after-the-fact; employers have voiced how satisfied they have been with their employees who graduated from the Manufacturing Essentials Certificate; the Bridge goals aligned well with overall WorkSmart Network goals (WIOA); interactions with faculty and students were enjoyable; they loved being part of this initiative and that it was a great opportunity.

Administrators

Administrators were represented by deans and associate deans in academic areas, as well as operations, and directors over administrative functions for the college. The questions for this group were designed to provide an environmental scan of the bridge, PBF, resource world.

While the seventeen responses to the first question regarding what the greatest challenges would be to broaden the focus to completion from access were varied, they revolved around several major themes. These included college readiness (18%), increasing college costs/tuition (12%), declining funding for the technical college system (12%), length of time to complete traditional programming/opportunity costs (12%), funding the extra support students would need such as case management, counseling and advising (12%), developing career pathways and have faculty “buy-in” to less-than credentials (12%), inability to meet student needs with move away from “traditional” developmental education courses (6%), how to address loss of students due to “jobbing out” (6%), lack of alignment in college transfer policy to four year institutions (6%), and lastly, how to support part-time faculty so as to decrease negative impact on student learning (6%).

One administrator (16.67%) had indicated that their employer advisory committee had taken a more active role in their program curriculum development. Another indicated their committee had not. Another wasn't sure. And finally, three indicated it was not applicable to their work.

When asked what interests administrators had in developing bridge programming, their responses varied with the most cited being to diversify the technical program (67%) and to address the needs of low-income, low-skill adults (67%). Other interests included addressing industry needs (50%), developing a career pathway in manufacturing (50%), and increasing enrollments in the technical program (50%). Creating sector strategies to support the area's economic development was not nearly as popular at 33%.

Most of the administrators indicated their role in the grant was to collaborate with other areas in the college to develop the bridge program model (83%). Many also attended grant activities (67%), or supervised staff (50%), full time faculty (17%) or part time faculty (33%). Some were responsible for monitoring and reporting on the grant progress (50%), implementation of the grant (50%), or writing portions of the grant (50%).

Administrators reported that the faculty and staff responsible for carrying out the work of the grant were largely supportive or very supportive (67%). One reported neutrality (17%) and another indicated opposition (17%) to the programming. They also indicated that they had provided training opportunities for the faculty and staff to carry out this work, either diversity training through the college (50%), pedagogical training through another entity (50%) or the college (17%), or had participated in a conference or training specifically on bridge programming (50%). Three administrators indicated that the faculty and staff had previous

meaningful experience with these populations (50%) and another indicated the faculty and staff had not received any training (17%).

Nearly all administrators (83%) indicated they had previous experience with running either a bridge program or other mainstreaming program that required an interdisciplinary approach.

With this bridge certificate work being grant funded, three administrators (50%) indicated they occasionally experienced a shortage of resources. The other 50% indicated they had never experienced a shortage of resources. The non-monetary resources lacking were finding qualified instructors (40%) and finding physical spaces to do the training (20%); equally represented among monetary issues at 20% were funding to pay instructor salaries and benefits, funding to pay for new instructional equipment, and funding to pay for new tools or software to support the grant or instruction. However, when asked how likely it would be that they could offer this training if it wasn't grant funded, nearly all administrators (83%) indicated they would not be able to offer this training. One administrator (at 17%), thought it likely they could offer the training without grant support.

Three administrators indicated above or far above expectations to develop a relationship with key industry partners (50%); the remaining three indicated this was not applicable to their work. For those three that worked with industry partners, the partners came from program advisory councils (50%) or from outreach to area manufacturers (17%). The administrators indicated that the industry partners were found to be very supportive (50%) of the manufacturing essentials credential. These partners demonstrated support of the credential by hiring graduates (50%), or opening their businesses for student tours (50%). One administrator indicated that the business allowed a current employee to participate in the training (17%).

All administrators indicated they agreed or strongly agreed that they understood employers' needs for a skilled workforce. Four of the administrators (67%) opined that the credential employers' needs for entry level workers well or very well. Two did not know (33%). Half of the administrators felt their areas were able to respond somewhat well to employers' needs (50%) while one felt they were able to respond reasonably well (17%) and two reported this was not applicable to their areas (33%).

Five of the administrators (83%) indicated they felt supported or very supported by their supervisors to engage in this type of work. One felt somewhat supported (17%) by their supervisor. Four of the administrators (67%) indicated that the state system office was supportive or very supportive of their work. One did not know (17%) and for another it was not applicable (17%). Many did not know how supportive the state legislature was of their work (67%) and two thought this wasn't applicable (33%). Four of the administrators (67%) felt that the college was on its way or well on its way to aligning their work at all these different levels while two expressed somewhat less progress (33%).

Each administrator had a unique perspective on their most significant opportunity to build career pathways at the college: one wanted to be of support from the start of a conversation to pursue bridge programming and provide their testimonial on the benefits of bridging; another expressed that bridge programming is a successful strategy to diversifying programs; one indicated that developing the right, collaborative team to help bridge students into programs was a significant opportunity; another administrator indicated they would nearly always be in support of other academic areas creating bridge programs; one stated that finding the right fit to meet employer skills needs would be a significant opportunity; and lastly, one administrator explained

that aligning program curriculum so that courses could be taught across program areas when delivering similar content would be the most significant opportunity in creating career pathways. By far, according to most of the administrators (4 or 67%) the greatest challenges to building these career pathways deals with funding. This included funding to start pathways, funding to sustain programs, funding to support faculty time, and just plain funding. One noted the challenge of the significant administrative burden of grant management. Another administrator noted the challenge of communication and wanted to be included at the onset of bridge discussions. Another noted the challenge of getting faculty to move from a program level focus to a cluster or unit level focus so as to get faculty buy-in and reduce silos.

While funding was an issue of concern for most administrators, two (33%) indicated that PBF around bridge programming guides their work, another two indicated that it somewhat guides their work and one indicated it does not guide their work at all (17%). One did not know. Only one administrator expressed an opinion on how the college could help strengthen industry alliances to increase industry competitiveness and that was to continue to foster mutually beneficial relationships between all players (college and state regulatory agencies, local community based organizations, local workforce partners, and employers).

As a last word on anything related to bridge programming, career pathways, or PBF, three administrators shared some insights. The first expressed support for bridge programming as a strategy to provide the needed assistance to students from disadvantaged backgrounds to make programs accessible. The second would like to see college transfer included as a PBF measure. A third is to move career pathways beyond the current chunking into stackable credentials to something that allows for more flexibility in packaging skillsets that better meet employers' needs and create opportunities to meet the needs of an evolving industry/workforce.

Businesses

Several surveying efforts have been undertaken by the college in the last two years. Of these, two will inform this case study.

The first, the *Core Workforce Skills Assessment* conducted in 2014, was deployed specifically to identify the skills gap. Led by the college's teaching center and institutional research office, the survey was sent to over 4,310 industry partners. Of these, 571 responded and 435 completed the survey. The reason for inclusion of this particular study is that 75 of the respondents were manufacturers and the single largest category of employer to respond (the next largest was healthcare at 50 of the respondents).

This group of 435 was further drilled down to 252 who identified as employers who had hired college program graduates. This group was presented eight skills and asked the importance of each skill and their level of satisfaction with each one. These results were then used to develop a rubric that was used to assess student assignments to see how well the skills were being taught across schools and disciplines. The gap analysis results are listed in table 10.

Table 10. Employer's Rating on Skills Importance and Satisfaction with Program Graduates

Skill	Gap Analysis - % Difference Importance vs Satisfaction (n=252)
Self-management (manage time and stress, practice workplace etiquette, self-assess)	-35%
Critical thinking (evaluate, solve problems, make decisions)	-30%
Social Interaction (respond to feedback, respect diversity, work effectively in a team)	-28%
Communication – Listening	-23%
Ethics	-22%
Communication – Speaking	-20%
Communication – Reading	-15%
Communication – Writing	-8%

The assessment of 646 student assignments indicated that more than 40% of students were not assessed in social interaction (46%), communication – listening (49%), and communication – speaking (63%). The most assessed and clearly demonstrated skill was critical thinking at 85% with only 2% of the students not being assessed. This information is being used to re-imagine the core competencies the college teaches, developing curriculum to address the gaps, and informing teacher training and development. This work will be ongoing and a new survey will be conducted in 2017.

The second surveying effort included in this case study is the initial work required by the grant to assess the needs of local employers and determine whether the manufacturing essentials certificate would help meet their employee needs. Three manufacturing areas were targeted: fabricators, those who hired machine operators, and those who hired computer numerical control operators. Across the board, 69 individual employers were surveyed, of which 43 responded to the question: *why you would or would not likely hire someone with the Manufacturing Essentials Credentials*. The question was open ended and their responses, by area, are categorized below in table 11. Numbers are rounded up and may equal more than 100%.

Reasons cited for likely to hire included candidates having some experience, exposure to manufacturing. Reasons cited for likely to not hire included wanting more experience, too basic of training. Those who indicated they needed more information were not sure if the training would be useful or applicable to their positions or processes, and that they would want to more closely identify the skills, aptitude and attitude of the candidates.

Table 11. Manufacturers likely or not likely to hire graduates of manufacturing essentials certificate

Manufacturing Area N – employers surveyed; and n – employers responded to question	How Likely to Hire	Employer Response
Fabricators N = 24 n=14	Likely to hire	3, 21%
	Not likely to hire	6, 43%
	Unsure/need more information	5, 36%
Machine Operators N=27 n=18	Likely to hire	10, 56%
	Not likely to hire	5, 28%
	Unsure/need more information	3, 17%
Computer –Aided Numerical Control N=18 n=11	Likely to hire	7, 64%
	Unsure/need more information	4, 36%

The fabricators responded less favorably to the hiring questions and indicated they needed more highly trained and experienced workers in assembly and finishing techniques.

With this broad review of findings for students, faculty and staff, administrators and employers, we can now turn to the discussion and explore the implications for future research.

CHAPTER 5

DISCUSSION AND CONCLUSIONS

The goal of this case study was to examine the experience of a two-year institution around PBF, completion, the skills gap, and bridge programming, a promising intervention for moving low-skilled, low-income, and minority students into credit programming and closing the skills gap. Much of the current literature around PBF studies combines the experiences of all IHEs on a state level, obscuring the nuances of differing missions and experiences of two- and four-year institutions. Two-year institutions are typically open access institutions, enrolling people who *choose* to attend the institution. Most four-year schools select their enrollees, at varying degrees of selectiveness. The type of student and his or her set of experiences varies significantly between the two types of institutions. Two-year schools tend to enroll more first-generation, minority, poor, older, students who typically work at least half-time. Further, the awarding of a significant grant from the federal Department of Labor to a consortium of the State's sixteen technical colleges presented a unique opportunity to more fully explore how the technical colleges responded to employer needs in addressing the skills gap in an industry that is struggling on several levels. The grant was, totaling nearly \$15 million, provided over \$1.2 million to the college to develop a manufacturing career pathway.

Limitations of this Study

There were, of course, limitations to this study. The first was the inability to track wages. Data matching and integration between wages and educational attainment does not currently exist in this state. While this is a goal and a central expectation of the grant, it has not yet come to fruition. The lack of this information, even with triangulation from student responses, was not sufficient to learn whether the manufacturing essentials certificate provided a financial boost to the respondents in the workplace.

The second limitation, as was pointed out in the theory section of the literature review, was that not enough time has elapsed to fully observe the students' educational outcomes post-certificate. Students enrolled in one- and two-year programs and as this study tracked students on a rolling basis over the course of three years, it was not sufficient time to measure completion outcomes. There also wasn't sufficient time to observe whether the entry and exit points which are essential to career pathways were used and accessible.

A third limitation is a double-edged sword: this study was based on a grant-funded initiative. On the positive side, there was a very defined set of participants who participated in a very intentionally designed program. This narrowed the scope of the inquiry. However, on the other hand, the experiences of those who were surveyed (faculty and staff, administrators, and students) may have been different had they not been supported by a grant. In fact, one of the themes that cut across the student and employee surveys was that the grant facilitated a low-risk environment for students. How would the results have differed if the additional support afforded by the grant hadn't been present? One can only surmise from reviewing the literature.

Survey Results

About the Student Experience

The student survey results were illuminating. In terms of student success, an astounding number of students attempted to pursue educational opportunities beyond the 9-credit manufacturing essentials certificate. This meant that students desired an opportunity to pursue education with additional assistance and guidance. Students were very demonstrative of their enthusiasm to be in school. They enjoyed the instructors (84%), and learning (84%) the most. They enjoyed meeting new people (69%) and being in school (69%) and they even enjoyed the challenging nature of the work (59%).

The diversity of the group is unlike anything this area of the college has experienced. In that way, this certificate has fulfilled two of its main goals – student persistence beyond the certificate and increase of diversity in the technical programs, with the end goal, of course, of diversifying the workplace. The extra support these students received was absolutely essential to their success – this was seen more pronouncedly in the larger group of non-responders who had continued on for education beyond the certificate and whose support base (intensive advising, counseling, collaboration of faculty, etc.) had ended. Here, nearly 25% of these students were not in good standing academically or financially when they left the college and will face significant barriers should they return. This additional support was cited by students and faculty and staff as critical to the success of the students inside the classroom. The collaboration of the faculty, the enhanced communication, and the shared goals around moving these students through the programming helped round out the success of these students. In alignment with the literature, the

administrators indicated that this much-needed level of support was not sustainable: they simply were not able to offer this type of programming without additional resources.

Of the thirty-five respondents, 31 indicated they had experienced significant barriers to success – a full 86% of the students. Three of the four that indicated they had *not* experienced barriers were male. Given that the type of student enrolled at the college has more life demands placed on them, it will be especially important to find sustainable solutions. As the focus moves to completion, it will be imperative that allocations for this type of support be championed and offered. This may mean schools, much like the college in this case study, will need to make some hard decisions about what truly matters, how it works through its competing missions, and what type of support it receives from the state system and the legislature to scale these types of interventions.

While the college will need to make some hard decisions, there may be some strategies that are not as costly to implement: another component that was cited as important to students' success was the cohort-based model of instruction where students and faculty alike were paired over a series of courses. This is especially important for non-traditional students who may not as actively engage in co-curricular activities as more traditionally-aged students due to work, family, or other commitments.

For example, of the 35 respondents, 19 worked *full-time* and another nine worked part-time. A well-known formula for organizing study time at the college level is that for every hour a student is in class, the student should spend two to three hours outside of class doing the homework, reading, group work, etc. Now, a nine credit load, which seems innocuous enough, turns into a 27-hour weekly commitment. The schedule for this certificate was aggressive, with students enrolled in blocks of time in the evening, mostly, for several days a week, over the

course of a semester (sometimes longer, depending on faculty and facilities availability). While 40% of students cited a convenient schedule as a reason for enrolling in the certificate, even as a short-term certificate, the commitment needed to complete was significant. Case in point, only 25% of the students indicated they *enjoyed* the class schedule. And 50% of the respondents indicated it was the one thing they found most difficult about the certificate. To balance school with full- or even part-time work, plus family obligations, is not easy. And yet, it is what a significant amount of students at the two-year college level do every day.

Having and creating a sense of community with the same people over a period of time, then, especially as this balancing act became more difficult, was important to the students' success. Nearly 69% of the students indicated that they studied with their classmates while 47% indicated they studied at the library and only 13% cited a tutor. While students indicated that both the CTE and developmental instructors had high expectations and were generally very helpful, only 22% indicated they *studied* with an instructor. A very real and sustained connection with each other and their instructors was absolutely central to the students.

The skills the students learned were also important. One of the most important was helping students gain confidence that they could complete college-level work - nearly 86% indicated as such. Moreover, 88% of the students indicated the certificate prepared them well or very well to be timely, attend classes and work hard, all self-management skills. They also felt very positive about the instructors and the technical skills they taught, with 94% indicating the manufacturing faculty were moderately or very helpful. Likewise, 97% of the students indicated the developmental and academic faculty were moderately or very helpful in learning foundational skills in communications and math.

On Wages

As indicated in the limitations section, wage information was difficult to triangulate from the respondents. Thirty-two of the respondents indicated they were employed prior to entering the certificate program, with nearly slightly more than 40% indicating they were already in the area of manufacturing. Eighteen students indicated they stayed with that same employer and these respondents stated that they had not received a change in their rate of pay after completing the certificate. For those that had changed employers (nineteen students indicated they had changed employers after completing the certificate), nine, or 47% reported a significant increase in pay of more than \$1 and another nearly 37%, 3 students, reported a slight raise in pay between five and forty-nine cents. Low pay was finally recognized as an issue and cited in the 2015 National Association of Manufacturers member survey. Critics of the skills gap have indicated that if employers paid more, they wouldn't experience the shortage in workers as acutely as they do. Indeed, in the county where this college is located, entry-level wages in the targeted SOC's of 49 and 51, *Installation, Maintenance, and Repair Occupations* and *Production Occupations*, respectively, range from \$19.21 per hour in SOC 49 with an associate's degree, to \$11.11 per hour in SOC 51, also with an associate's degree.³⁹ SOC 49 has a growing job base while SOC 51 jobs are becoming available as current workers are being replaced, even as the number of jobs in this classification is shrinking (*Making the Future*, 6).

About the Faculty and Staff Experience

Faculty and staff were, overall, very positive about their experience both professionally and personally. They each enjoyed being part of an effort that had streamlined goals and in

³⁹ May 2014 Wisconsin Occupational Employment and Wage Estimates

which there was a structure or framework for consistent and constant communication with an area of the college they normally did not work with on any significant level. For many of them, the work they did for the grant did not differ from their day-to-day work at the college (62%), and so very few received training to carry out the bridge work of the grant. Yet, a majority of the faculty and staff felt supported or very supported by their supervisors to carry out the work (81%) and had the necessary instructional materials to do their work. Those who did not feel as supported worked in roles that demanded several different types of outcomes (for example, case management and recruitment or advising and recruitment).

While many of the faculty and staff indicated they felt the bridge students were capable (58%) or very capable (12%) of doing college-level work, they indicated the most important factors that contributed to that capability were the support class instruction, the students' interest in the career area, and the cohort-based model. Some felt that students could have benefitted from even more additional support and case management to help mediate the personal problems impeding success. Some faculty, and this was also noted by some administrators, wanted to develop programming that would truly meet the needs of employers by replacing non-technical skills with more technical skills, even though the faculty and staff felt that the certificate prepared students well for entry-level work.

The value of the certificate moved beyond the workplace in that most faculty and staff indicated that the model helped students learn more about manufacturing career pathways, it provided for them a positive schooling experience, and it increased the students' confidence in doing college-level work. This confidence and desire for continued education was very clearly demonstrated in the number of students pursuing additional education beyond the certificate.

Faculty and staff felt very proud of their work with this group of students. Some indicated that these courses were the most engaging they've ever taught. Others were reflective – they appreciated witnessing and experiencing the growth of self-esteem and confidence of both the students and themselves (as some were new to teaching), while others indicated they did not have much experience with non-traditional students in their areas.

Lastly, while most faculty and staff indicated they would do this work again with no reservations (81%), there was some frustration expressed with the desire for additional wrap-around services, the infusion of more technical skills into the curriculum, and the lack of alignment between the certificate and the associate and technical diploma curricula. This lack of alignment forced a lot of manual work updating student records and prevented students from transitioning immediately into their longer-term programs.

About the Administrator Experience

While administrators appreciated the opportunity to engage the faculty and students in this work, their focus, as can be expected, was much more on policy, particularly around policy they had little control over. These issues included college readiness, increasing costs to attend college, declining funding for the college, and the lack of alignment in Wisconsin on college transfer to four-year institutions. These concerns certainly align with national conversations.

Moreover, they also expressed concern about developing an institutional culture to one that is more aware of, and welcoming to, a changing demographic and those particular (different) needs. The length of time to complete traditional programming and being mindful of the ensuing opportunity costs for students was noted. Many expressed a concern about lacking funding to provide the extra, intrusive support students would need to successfully move through the

college's academic programs, pathways, bridges, or whatever option students were taking. The college enrolls nearly 23,000 credit-based students in the 2016 academic year. These students are supported by 9 counselors and 21 advisors college-wide.

The administrators, keenly aware that faculty collaboration and leadership is critical for any successful work, were concerned about faculty buy-in to what some faculty see as “less-than” credentials. This concern was mirrored in the faculty section where some wanted more technical skills taught rather than general education courses (so students could ‘learn more manufacturing’).

Some administrators worried that in moving students away from developmental education (some states have gone so far as to ban or severely limit remedial education⁴⁰), they will be less able to meet those students' specific needs. This is further compounded by the reliance on adjuncts to deliver instruction as a means to balance budgets, a reliance which overall, may have a negative impact on student learning.⁴¹ Finding new, sustainable ways to support part-time faculty in their work would improve student outcomes

Given the administrators' interest in participating in this grant to diversify technical programs and address the needs of low-income, low-skilled adults, 83% of them found it not or somewhat likely that they could have run a program like this without grant funding. It is clear that the current college structure will not support the intense support these students need. The college would need to make an investment in additional training for faculty for sure, but also to

⁴⁰ See <http://hechingerreport.org/new-policies-close-off-opportunities-to-college-applicants-in-need-of-extra-help/>; <http://www.educationdive.com/news/five-states-see-striking-progress-with-corequisite-remediation-model/412517/>; and, <http://www.chronicle.com/article/Push-to-Reform-Remedial/145817/> for an overview of current trends in developmental education.

⁴¹ See, for example, <https://www.insidehighered.com/news/2013/11/15/study-finds-no-impact-student-success-having-adjunct-instructors>; research has been inconclusive. Some, as the administrators in this survey, point to improving support for adjuncts so as to improve the student experience.

increase other support services to bring the students through to completion. It is especially troubling and urgent – although not enough time yet has passed to have a complete picture – to note that of the ten students who have graduated from at a least a one-year technical diploma or higher, nine were males and eight were white.

Business Experiences

While businesses were not directly surveyed as part of this study, their needs aligned with what the literature indicated - they want and need workers who are experienced, are a good “fit” for the company, and require little to no training on their part. Businesses indicated they needed workers who could be on time, show up for work, manage themselves, communicate well, problem-solve, and think critically. The college is aiming to re-imagine its core competencies for students based on this feedback to help meet businesses’ needs for skilled workers. And yet, the most successful of the *Wisconsin Fast Forward* initiatives developed and strengthened sector responses and strategies to address skilled worker shortages *collectively*, i.e., it was not the job of any one entity to help workers acquire these skills – it was a group effort. In this case, the partnership included the local workforce development board, the technical college, and a nascent business organization/alliance that were able to come together to determine, develop, and implement training for member businesses and across seven of their key occupations (Salem, et al. 7). This training led to an increase in hourly wages for workers and a strengthening of the workforce for a regional industry alliance, i.e., all the members – and their employees – were made stronger because of the shared training.

In some ways, administrators are seeking to do the same by leveraging programs at the cluster level versus individual program level. In doing so, the career cluster area is strengthened,

students are cross-trained, new skills can be packaged in different ways in response to industry needs, and students have a broader bridge to find a career pathway. To fully make this change, however, would take an institutional cultural change and move programs, program directors, and program advisory boards beyond the scope of just their particular area of interest. This change could be important, however, as 100% of the administrators either agreed or strongly agreed that they understood employers' need for a skilled workforce yet only 17% felt they were able to respond to employers' needs reasonably well, and 50% somewhat well. Although PBF, at least through 2018, is an important mechanism by which funding is distributed to the college, only 33% reported that it guides their work, another 33% indicated it somewhat guides their work while 33% indicated they didn't know or it didn't guide their work at all. This is in line with the Dougherty's findings (2011) on mid-level administrators' knowledge of PBF policies and how it impacts their work.

While the current rate of PBF funding is set to expire in 2018, the state administrative office has asked in the *2017-2019 Biennium Agency Budget Request*, citing PBF as a tool to “(incentivize) positive, sustainable and incremental progress toward policymakers’ strategic priorities,” to “provide certainty for outcomes-based funding” and “...*statutorily* define 30 percent as the on-going set aside for outcomes-based funding in 2017-18 and thereafter.” No mention is made of additional or different outcome measures, particularly in dealing with transfer to four year institutions, although it is indicated as a goal for the system.⁴²

⁴² See page 60. <http://www.doa.state.wi.us/Documents/DEBF/Budget/Biennial%20Budget/2017-19%20Agency%20Requests/292-WTCSB%20combined%20rev%2009262016.pdf>

Conclusion

Having had an opportunity to more closely explore the state of higher education from a broader perspective and apply it to a case study of a short term manufacturing essentials bridge program was instructive.

First, the results, at least initially, partially mirror the findings of Hillman, et al. (2015) that saw an increase in the number of those students completing short-term certificates at the expense of longer-term credentials. Again, however, not enough time has passed to realize the completion rate of those who continue in programming. The ten students that managed to complete thus far is not so optimistic (a rate of 7%). This is in comparison with a graduation rate of about 31% for the college (also not a great rate but in line with community colleges).

The number of students who continued studying post-certificate was inspiring, largely because the data evidence that poorer students and students of color do not have the same kind of educational outcomes that their white, wealthier counterparts enjoy. Therefore it was sobering to see the number of students who had limited success in post-certificate studies once intensive, intrusive support services were removed. Even today, the bridge programs only promise wrap-around, intense services in the first semester of study. Clearly, if the concern is graduating students who have sufficient education, training, and the right skills to meet business needs, especially in the areas of self-management, communication, critical thinking, and problem-solving, then policymakers, state administrative office officials, colleges, and businesses will need to find innovative ways to provide for the additional support and a college structure or environment to help students persist to completion and move beyond the barriers that poverty erects. Some of this restructuring work is being done by redefining and reshaping developmental

education, developing cohort-based programs, or developing very narrow, very guided programs with little choice for students to veer off track (i.e., moving away from the cafeteria model of community college). Additionally, there has been movement from the state administrative office to reduce the number of general education credits required for programs to minimize the time to completion and increase retention. While some may welcome this change, its success will only be effective if the rest of the program can be re-imagined to stress, build, or enhance the skillsets that may be threatened with a reduction in credits. All of these strategies could provide for an important start.

Second, the study clearly illustrated the need for comprehensive sector strategies to more fully support students, incumbent workers and businesses to meet the needs for skilled workers. WIOA calls for this kind of collaboration and the models that have demonstrated success in the state have operated under this cross-business, cross-agency, cross-educator model. Educators, businesses, and policymakers all have a place at the table to develop and implement strategies, policies and practices guided by the Alliance for Quality Career Pathways framework (AQCP). For this particular college, the programs and models created under the auspices of this grant were a great start but they were not sufficient nor were they true pathways based on the four hallmarks as identified by the AQCP framework. In fact, while data was not immediately available as to the level of business participation with the short-term bridge certificate, it is worthwhile to note that since the ending of the grant, the manufacturing essentials short-term bridge certificate mapping into the machine tool program is no longer offered.

Pulling up from examining the college experience, the need for this model nation-wide is also evident. In the late 1970s, the storm that had been brewing for decades finally broke and the ensuing changes left businesses searching for ways to compete globally, moving manufacturing

processes to low-wage countries, while policymakers sought ways to address the large-scale changes that a knowledge-based economy demanded. High-level policies, profit-seeking, and an unrelenting, increasing return to those who had at least a bachelor's degree, resulted in a divestment in American workers, hitting hardest those with little- to no- education: men, Blacks and other minorities, and the middle class who had been earning living wages in the manufacturing sector. Whole communities collapsed. Those with the skills followed opportunities. Those without remained in cities that were shells of what they had once been. As was noted in table 1 on page 48, several states had legacies of a high percentage of their workforce being tied into manufacturing according to 1977 numbers. By 2012, six states were able to transform themselves into high-skill, high-demand equilibrium states according to the OECD. None of these states, as of 2013, have manufacturing as a significant percentage of their workforce. In comparison, those states that are in low-skill, low-demand equilibrium in 2012 (like Iowa and Wisconsin), are those whose percentage of their workforce continues to be tied predominantly to manufacturing in 2013 (at 14 and 16.3%, respectively, for IA and WI). In fact, eight of the top 10 manufacturing-as-a-percentage-of-their-workforce states, are labeled as low-skill, low-demand states by the OECD. This presents a dilemma to states who want to diversify their economic base and improve the outcomes for its citizens and yet rely on a strong manufacturing base. It will be thus even more important to develop policies, incentives, and sector-level strategies to leverage training and push companies and agencies to move past competitiveness to one of collaboration so that entire areas can advance.

While inclusive economic development is becoming less a social justice issue and one more of necessity, the systems that support these collaborative efforts are not yet in place. There was promise in the *Wisconsin Fast Forward* initiative as it moved to diversify the economic base

of the state and invest in and leverage worker training. While the jury is still out on this program's effectiveness, its working guidelines calling for collaboration among partners were on target.

Given the changing demographics, the impending retirement of baby boomers (slowed only by the Great Recession), and the reduced population replacement rates, it will be incumbent on policymakers at all levels, businesses, and educators to develop and align policies, programs and practices to most widely and wisely utilize the talents of *all* its human capital to advance an “equitable growth agenda.” To *not* do this has an economic cost. According to Manuel Pastor of the University of Southern California, in Wisconsin, that loss translates into \$15bn of foregone economic productivity each year. In Iowa, that loss is over \$5bn, and on a national scale, the country loses out on an additional \$2.1 *trillion* of economic benefits from underutilizing its human capital.⁴³

Poverty exacts a price. The skills gap exists because poverty has become so pervasive. In the student survey, the barriers students identified were deeply entwined with poverty – having to work full- or part-time, having childcare issues or transportation challenges or health or food security issues. These basic human needs will always take precedence and consume one's attention and effort. It's only when these needs are met that *most* people, be they students, poverty-level wage earners, or non-traditional students, can turn to those higher-level needs of esteem and self-actualization and move closer to becoming the employee that is the “right fit” for employers.

The skills employers want to see are developed through time and family who has the capacity, resources, and support to nurture and guide their children as part of a society that, as

⁴³ Manuel Pastor, Policylink, National Equity Atlas, <http://nationalequityatlas.org/data-summaries>

Robert Putnam puts it, operates out of a “we” mentality rather than an “us” versus “them” mentality. In Madison and Milwaukee, likewise in Cedar Falls and Waterloo and Des Moines, the inability to create a “we” mentality has led to a bifurcation for these cities’ residents so that predominately white, wealthier residents experience a different city than residents who are poor and minority.⁴⁴ Wealthier whites were able to stay abreast of, and benefit from, the changes in education. They got into the better schools, they saw the highest returns to their educational investment and passed this inheritance on to their children. Others were not able to pursue these means, and today are represented in a polarizing economy where low-skill jobs are abounding - even more so than middle- or high-skill jobs. With no slowing down of the growth of these low-end, low-wage service jobs, finding innovative ways to support these workers – the “we” - through accessible and equally beneficial training, work and educational options, is critical. Policy is central to this type of multi-layer, multi-partner work.

The study was instructive on the use of PBF as a policy instrument by Wisconsin lawmakers precisely for this reason. By law, PBF was supposed to end in fiscal year 18, after a series incremental increases in how general state aid was appropriated to the technical colleges (starting at 10% in 2015/2016 and ending with 30% in the 2017/2018 school year), even as general funding levels for higher education went down (i.e., the pot was being distributed differently even as the pot was shrinking). There was nothing mentioned for how funding appropriations would be carried out after 2018. This signaled that the governor and legislatures would re-visit the issue for the following biennium.

⁴⁴ It is important to note that while this study focused on the poor and minority as that is what the target population is for bridge programming, the divide between those who have and those who have not is based on socioeconomic status and not necessarily solely race. Although, by far, as a percentage of the population, Blacks and Hispanics are still disproportionately overrepresented in poverty indicators.

Meanwhile, the state administrative office felt that the 30% was sufficiently aggressive to allow for a resounding success in aligning the work of the technical colleges with policymakers' goals. For the next biennium, the state administrative office is now petitioning for the PBF policy to be written into state statute at the 30% appropriation level. Currently, not all administrators, as indicated in the survey, are affected by PBF on a day-to-day basis. If PBF will become the norm of how effectiveness is measured and funding is distributed, this will most likely need to change. Training on PBF would also need to be extended down into the faculty and staff ranks so goal coordination and communication can more easily occur.

In the same biennium budget request document, the state administrative office indicates that transfer is an important goal; however, this has not been requested as an outcome measure. In terms of policy, this is a missed opportunity if Wisconsin wishes to move from a low-skill, low-demand equilibrium state. While over half of the jobs will require postsecondary work, it is those at the bachelor's degree or higher that have realized the most benefit in terms of wage compensation. Increasing the rate of bachelor's completion will be essential to diversifying the economic base, as well as supporting those industries. In Dane County, where Madison is located, diversification has already taken root - the county now claims higher median household income than the rest of the country for Whites. Dane County had the lowest unemployment rate in Wisconsin during the Great Recession. Its "growing industry clusters" include biomedical/biotechnology, information technology, knowledge creation, and business/financial areas. However, as was noted earlier, its poor and minority residents missed out on these

opportunities as is evidenced by African American and Latino median household incomes being *less* than the national level.⁴⁵

While increasing the educational level of those who have traditionally not participated in higher education will be important, it will be just as critical to have industry be an integral partner in the work. These businesses will need to be open to providing work opportunities to people they don't usually hire – and commit to them. Policymakers would provide scalable, replicable incentives for businesses to engage in and leverage this work across targeted geographical areas and industries. Policymakers would also need to make this kind of investment as barrier-free to businesses as possible. If too much time is spent on the administration of such programs, businesses will be reluctant to participate. Further, the K-12 systems will also need to be equal partners at the table since many poor and minority children are lost in this pipeline.

The study allowed the in-depth examination of one particular effort in a history of building career pathways. The case study highlighted that the best outcomes for students occurred when administration, faculty and staff, along with support of state administration office, worked together to support students. Goals were clear, communication was consistent and constant, and systems were aligned to support students - WIOA representatives, businesses, support staff, administration, faculty, and the college's systems. Moreover, students felt connected to the college and to their area of study. The students overwhelmingly had an interest in the discipline and continued on to study past the certificate. Also critical was the funding support students received. Tuition and books were paid for as part of the grant. This was

⁴⁵ According to the City of Madison Economic Strategy Plan, Dane County median household income is \$65,000. The US median income is approximately \$55,000 and the City of Madison is slightly above that – at \$57,000. National median income for African Americans and Latinos is \$35,000 and \$41,000, respectively. Dane County levels are \$28,000 and \$33,000, respectively. The City uses the 2012 ACS as their data source. See more information here:
www.cityofmadison.com/dpced/economicdevelopment/documents/SYMPOSIUM_FULL%20PRESENTATION.pdf

important. However, it was this financial assistance compounded with the intrusive advising that was key to helping retain students. When students continued on past the certificate, students no longer received the advising support. This lack of guidance became apparent in the alarming number of students who experienced limited success post-certificate. Upon examining the reasons for holds on accounts, nearly all students who experienced limited success received failing grades or withdrew from classes, in turn adversely affecting their financial aid eligibility and indebtedness. For students who do not have many financial resources to begin with, to expect them to be financially savvy and know how to operate the inside rules of financial aid is unrealistic.

While this case study certainly helped elucidate how various parties experienced bridge programming as a means to increase transition and completion rates while meeting the needs of businesses, it would be of great benefit to the field of higher education, and especially to policymakers, to be able to fully measure the effectiveness of a *true* career pathway structure developed according to the best practices identified in the AQCP framework. To date, this scholarly research is not yet available.

Given the challenges a polarized economy and society present, it will truly take a very intentional, very strategic alignment of goals, practices, and policies to make the needed impact to change trajectories for students and families – and to allow businesses to have their needs met for a new generation of workers as demographics continue to change. Research has to be a foundational basis for that inquiry.

Likewise, while recognizing that appropriations are one of the policy tools available to policymakers, it will take political will and additional research to assess the true state of

education and its importance to helping drive economic and human development and shape the question of whether education is indeed a private good or public good.

Lastly, additional research, funding, and policy alignment is needed to help two-year institutions, who educate a significant number of poor, minority, and non-traditional students, create the type of infrastructure and culture to best support its students to complete their educational and training goals. Administrators had mentioned the need to reduce time to complete to help offset the opportunity cost of being in school. By changing the face of developmental education and reducing credits required for programs (typically by reducing the number of general education credits), this move has already begun. However, if this is indeed to become a viable tool for increasing completion and helping students transition into work on an accelerated basis, then the skills that are found in these general education courses will need to be driven deep into the career and technical education courses. Given that two-year schools predominantly hire occupational experts and rely more heavily on adjuncts to meet budget constraints, the need for additional professional development to help these instructors teach these skills within the context of technical education will be absolutely essential to help students - and the businesses that hire them – succeed. Further research into this should be of primary importance.

Summary

This case study allowed for a snapshot in time as to how participants performed and advanced through the first chunk or step of a career pathway in manufacturing. It allowed for a “zooming in” to examine the details around the wrap-around services, the bridge instructional

model, and the administrative support that these students needed to successfully complete the certificate and move on to their next step, be that continued education in the pathway, employment, or something else. The key contribution of this study is that it clearly indicated the critical need for intensive and intrusive support services for working with a population who does not have the same level of social, cultural, and economic capital as their wealthier counterparts. Those students who had limited success did not have the institutional or cultural capital to use their agency to advocate for themselves. The lack of these resources, unfortunately, led to a damaging financial and educational situation that will make it difficult for these students to re-engage their educational journey. It may have other implications as well for their financial future as tuition owed leads to collections and credit reporting.

As workforce demographics continue to change and the climate of accountability continues to exist and perhaps even grow, it will be incumbent upon policymakers to develop performance funding measures that truly support resource-intensive support services and allow for the additional resources to scale these interventions. In line with policy, educators will need to create a college structure and culture that supports students through completion in areas of study and with credentials that have sufficient currency in the market so they can support themselves, and their families, in meeting not only their basic needs, but beyond. These students need to know they - and their struggles - matter and that their well-being and success matters. It is only through these very intentional actions that we can begin to put ourselves back together as a society.

To reiterate, these issues are not red or blue, but rather, purple, as Robert Putnam indicated in his latest book. It takes a both/and approach - an important reminder - especially as another election is upon the country and the differences that divide the country are exploited by

both camps and laid to bare. Given the nature of the challenges and the future that is at stake, it will take action at *all* levels to affect the change that is needed to re-create a world of “we.”

Anything short of that, unfortunately, will not be sufficient.

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APPENDIX A

WISCONSIN'S PERFORMANCE-BASED FUNDING MEASURES

Formula for Allocating WTCS Performance Funding**June, 2014****Selection of Seven of the Nine Performance Criteria**

The statute provides that performance funding be based on a college's performance with respect to seven of the nine performance criteria. Annually, each college will designate which of the seven criteria will be used for its allocation. This annual designation will be made prior to aid being calculated for each fiscal year.

Three Years of Data

The statute requires that the formula be based on performance data in the three previous fiscal years. To avoid having to make adjustments to amounts after the fiscal year has begun, the three most recent fiscal years for which actual data is available will be used. For example, the distribution in 2014-15 will be based on data from 2010-11, 2011-12 and 2012-13.

Allocation of Funds Among the Nine PBF Criteria

The statute provides that the formula be based on a college's performance with respect to seven of the nine performance criteria and each college is allowed to designate which of the seven criteria will be used for their allocation. This annual designation will be made prior to aid being calculated for each fiscal year.

Twenty-five percent of the available performance funding in 2014-15 ($\$8,853,490 \times .25 = \$2,213,372.50$) will be divided equally among the nine criteria ($\$245,930$) as a base allocation of funds for each criterion. If a criterion is not selected by all the colleges, the base allocation will be redistributed among the other criteria. The remaining 75% of funds will be distributed proportionately among the nine criteria based on the number of colleges selecting a particular criterion. For example, if 12 colleges select a criterion, that number is multiplied by an equal share amount ($12 \times \$59,287 = \$711,444$) and added to the base amount described above ($\$245,930$) to determine the total funding available in that particular performance category ($\$711,444 + \$245,930 = \$957,374$).

Criteria #1: Job Placement *

Statutory Language: *The placement rate of students in jobs related to students' programs of study.*

Data Source: WTCS Graduate Follow-Up Report, FLW300

Formula: 50% of funds distributed based on a college's placement rate. The placement rate is calculated by dividing the number of graduates who report they are working in jobs related to their program of study by the total number of respondents who are employed (both in related and non-related jobs). The placement rate for each college is converted into points (for example, a 72% rate equals 72 points). Each college's share of the Placement Rate funds is based on their proportionate share of the total number of points generated by all the colleges.

The other 50% of funds distributed based on each college's proportionate share of the number of graduates who report they are working in jobs related to their program of study.

Criteria #2: High Demand Fields *

Statutory Language: *The number of degrees and certificates awarded in high-demand fields. The board and the department of workforce development shall jointly determine what constitutes high-demand fields and revise the determination as necessary.*

Data Source: Department of Workforce Development Long-Term Occupational Projections for 2010-20; WTCS Client Reporting (Degrees and Certificates Awarded)

Formula: The process for identifying the High-Demand fields involved first reviewing DWD's statewide long-term occupational projections for 2010-20 and selecting the Top 50 occupations (in terms of projected new jobs and replacement jobs) for which WTCS provides training. The occupations identified as the high-demand fields were then matched with the appropriate WTCS programs that produce graduates to work in those fields. The list of high-demand fields will be updated every two years as DWD updates its long-term occupational projections data.

100% of funds distributed based on each college's proportionate share of the number of students awarded degrees and certificates in the high demand fields. (NOTE: Certificates awarded will be reflected in future years once this data is collected and available.)

Criteria #3: Industry-Validated Curriculum

Statutory Language: *The number of programs or courses with industry-validated curriculum.*

Industry-validated curriculum is defined as a curriculum that is developed with business or industry input and that is based on competencies and assessments that reflect the skills and knowledge necessary for a specific job or jobs within a specific type of business or industry.

Data Source: WTCS Program Approval and Client Reporting

Formula: 75% of funds distributed based on each college's proportionate share of active (having enrolled students) programs. Remaining 25% of funds distributed based on each college's proportionate share of programs with Technical Skill Attainment (TSA) assessments (Phase 2 approval).

Criteria #4: ABE Transition *

Statutory Language: *The transition of adult students from basic education to skills training.*

Data Source: WTCS Client Reporting: Aid Codes 73 (Beginning ABE), 74 (Intermediate ABE), 75 (ELL), 76 (Adult Secondary Education) and 77 (ASE Developmental)

Formula: 100% of funds distributed based on each college's proportionate share of the number of adult students (unduplicated) who meet the following conditions: (1) were enrolled in at least 12 hours of instruction in adult basic education (including developmental education), adult high school or English language learning (ELL); and (2) successfully completed a postsecondary course (Aid Codes 10, 20, 30, 31,32 and 50) either in the year of ABE/ASE/ELL enrollment or the following year.

An "adult student" is any student 18 years or older, or have completed high school or earned a high school credential. Students receiving remedial instruction (Aid Code 78) are not included in this measure. For the third year of data (2012-13), transitioners through the summer and fall of 2013-14 will only be counted.

Criteria #5: ABE Services and Success *

Statutory Language: *The number of adult students served by basic education courses, adult high school or English language learning courses, or courses that combine basic skills and occupational training as a means of expediting basic skills remediation, and the success rate of adult students completing such courses.*

Data Source: WTCS Client Reporting (Aid Codes 73, 74, 75, 76 and 77), National Reporting System (NRS) for the Adult Education and Family Literacy Act (AEFL)

Formula: 50% of funds distributed based on each college's proportionate share of the number of adult students (unduplicated) who were enrolled in at least 12 hours of instruction in adult basic education (including developmental education), adult high school or English language learning.

The other 50% of funds distributed based on the success rate of students who demonstrated a gain of at least one educational functioning level under the pre and post-test administered as part of the federal AEFL grant and recorded in the NRS. A college's success rate (number of students completing a level divided by number of tested students) is converted into points (for example, a 41% success rate equals 41 points). Each college's share of the Success Rate funds is based on their proportionate share of the total number of points generated.

An "adult student" is any student 18 years or older, or have completed high school or earned a high school credential. Students receiving remedial instruction (Aid Code 78) are not included in this measure.

Criteria #6: Dual Enrollment

Statutory Language: *Participation in dual enrollment programs.*

Dual enrollment is defined to mean programs or courses of study designed to provide high school students the opportunity to gain credits in both technical college and high school, including transcribed credit programs or other educational services provided by contract between a school district and a technical college.

Data Source: WTCS Client Reporting: Recognized Credit Codes 1A (Advanced Standing), 1B (Youth Apprenticeship Advanced Standing), 8A (Transcribed Credit), 8B (Youth Apprenticeship Transcribed Credit), 9B (Youth Apprenticeship FTE Generating), 9C (Youth Options), 9H (s. 38.14 Contract)

Formula: 100% of funds distributed based on each college's proportionate share of credits earned in all types of dual enrollment including transcribed credit, advanced standing (reported once the student enrolls at a technical college), youth apprenticeship, youth options and s. 38.14 contracted services. (NOTE: Course options credits (Recognized Credit Code 9K) will be counted in future years once program is in effect.)

Criteria #7: Workforce Training *

Statutory Language: *The workforce training provided to businesses and individuals.*

Data Source: WTCS Client Reporting (for Employer Paid Training, Apprenticeship Training, and Professional Development Seminars); WTCS Contract Reporting (for Customized Instruction Contracts)

Formula: 100% of funds distributed based on each college's proportionate share of credits earned under the following workforce training categories: (1) employer paid training; (2) related instruction for apprenticeship training; (3) professional development seminars; and (4) contracts to provide customized instruction to public and private employers. (NOTE: All types of recipients of customized instruction are included.)

Criteria #8: Collaboration *

Statutory Language: *Participation in statewide or regional collaboration or efficiency initiatives.*

Membership in the following Statewide Collaborations: WTC District Boards Association (DBA), WTCS Purchasing Consortium, WTCS Marketing Consortium, Districts Mutual Insurance (DMI), Wisconsin Student Government (WSG), Worldwide Instructional Design System (WIDS)

Formula: 50% of funds distributed based on each college's proportionate share of full-time equivalent (FTE) students. The other 50% of funds distributed as an amount equally divided among the colleges. If a college decides to not participate in any of the six collaborations, then it would not be eligible to receive aid under this category.

PBF Criteria #9: Special Populations *

Statutory Language: *Training or other services provided to special populations or demographic groups that can be considered unique to the district.*

Data Source: WTCS Client Reporting (for Minority Students, Veterans, Incarcerated, Dislocated Workers and Persons with Disabilities); Wisconsin Student Support Information System or WISSIS (for Pell Grant Recipients)

Formula: 50% of funds distributed based on each college's proportionate share of the number of students (headcount) reported as being in the following special populations: (1) Minority (Non-White); (2) Pell Grant Recipients; (3) Veterans; (4) Incarcerated; (5) Dislocated Workers; and (6) Persons with Disabilities. Each population group will be calculated separately so that one category does not disproportionately affect the distribution of funds.

The other 50% of funds distributed based on calculating each college's special population numbers as a percentage of the college's total student population. (NOTE: For Pell Grant recipients, this calculation is done as a percentage of the college's total program student population.) The percentages are then rank ordered from lowest concentration (1) to highest concentration (16). Ranking points are totaled for the six special population categories. Each college's share of concentration funds is based on its proportionate share of the total number of ranking points.

* Each college selects seven of the nine indicators. The starred indicators were chosen by this college.

Results for 2015/2016 follow on the next page.

Distribution of 2015-16 Outcomes-Based Funding, by College and Criteria

(WTCS Outcomes-Based Funding: May 2016, 6)

Table 12. WTCS Distribution of Funding & Criteria Selection

	Criteria 1: Job Placement	Criteria 2: High Demand Fields	Criteria 3: Industry Validated Curriculum	Criteria 4: ABE Transition	Criteria 5: ABE Success	Criteria 6: Dual Enrollment	Criteria 7: Workforce Training	Criteria 8: Collaboration	Criteria 9: Special Populations	College Total
Blackhawk	\$ 117,592	\$ 74,776	\$ 103,800	\$ 69,752	\$ 116,257	\$ -	\$ -	\$ 114,178	\$ 129,329	\$ 725,684
Chippewa Valley	\$ 171,987	\$ 158,031	\$ 109,426	\$ -	\$ 91,603	\$ 91,267	\$ -	\$ 147,096	\$ 95,321	\$ 864,732
Fox Valley	\$ 225,120	\$ 246,314	\$ 298,887	\$ -	\$ -	\$ 142,621	\$ 255,057	\$ 196,143	\$ 143,305	\$ 1,507,447
Gateway	\$ 178,108	\$ 223,519	\$ -	\$ 227,803	\$ 226,534	\$ 197,144	\$ 178,903	\$ -	\$ 215,380	\$ 1,447,391
Lakeshore	\$ 120,694	\$ 85,939	\$ 151,718	\$ -	\$ 121,594	\$ -	\$ 68,186	\$ 111,926	\$ 118,968	\$ 779,025
Madison Area	\$ 208,602	\$ 277,545	\$ -	\$ 287,092	\$ 225,712	\$ -	\$ 159,676	\$ 247,765	\$ 231,291	\$ 1,637,683
Mid-State	\$ 120,726	\$ 88,027	\$ 129,411	\$ -	\$ 131,374	\$ 60,852	\$ -	\$ 112,703	\$ 140,062	\$ 783,156
Milwaukee Area	\$ -	\$ 200,085	\$ 270,822	\$ 446,015	\$ 382,465	\$ -	\$ 212,722	\$ 293,589	\$ 270,206	\$ 2,075,904
Moraine Park	\$ 126,980	\$ -	\$ 163,572	\$ -	\$ 150,404	\$ 263,995	\$ 225,701	\$ 127,047	\$ 174,679	\$ 1,232,377
Nicolet Area	\$ 78,337	\$ 48,615	\$ 59,723	\$ 42,881	\$ 91,519	\$ -	\$ -	\$ 94,684	\$ 73,523	\$ 489,283
Northcentral	\$ 151,940	\$ -	\$ 165,781	\$ 151,631	\$ 151,597	\$ 153,994	\$ 117,645	\$ -	\$ 182,461	\$ 1,075,050
Northeast Wisconsin	\$ 184,987	\$ 216,489	\$ 194,912	\$ -	\$ -	\$ 200,054	\$ 190,897	\$ 194,409	\$ 167,897	\$ 1,349,644
Southwest Tech	\$ 118,623	\$ 72,646	\$ 85,635	\$ -	\$ 86,038	\$ -	\$ 175,197	\$ 103,889	\$ 101,691	\$ 743,718
Waukesha	\$ 143,641	\$ 168,470	\$ 156,317	\$ -	\$ 161,969	\$ 359,404	\$ 111,284	\$ 150,974	\$ -	\$ 1,252,059
Western	\$ 145,708	\$ 129,995	\$ 139,780	\$ 96,701	\$ -	\$ -	\$ 100,901	\$ 136,306	\$ 144,601	\$ 893,994
Wisconsin Indianhead	\$ 177,416	\$ 161,440	\$ 122,106	\$ -	\$ 96,251	\$ 89,690	\$ -	\$ 121,181	\$ 81,750	\$ 849,833
Total	\$2,270,463	\$2,151,890	\$2,151,890	\$1,321,875	\$2,033,316	\$1,559,022	\$1,796,169	\$2,151,890	\$2,270,463	\$17,706,980

APPENDIX B

STUDENT SURVEY INSTRUMENT

Manufacturing Essentials - Student Experience
2. The Basics
<p>* 1. How did you learn about the Manufacturing Essentials certificate? Check one.</p> <p><input type="radio"/> Advisor</p> <p><input type="radio"/> Instructor</p> <p><input type="radio"/> Friend or Family Member</p> <p><input type="radio"/> Employer</p> <p><input type="radio"/> Flyer in the Community</p> <p><input type="radio"/> Other (please specify)</p> <div></div>
<p>* 2. What interested you about the certificate? Check all that apply.</p> <p><input type="checkbox"/> I was working, but not in manufacturing, and was interested in learning more about this as a career area.</p> <p><input type="checkbox"/> I was already working in manufacturing and I wanted to update my skills.</p> <p><input type="checkbox"/> I had been out of work for a while and needed to refresh my skills so I could successfully get employed.</p> <p><input type="checkbox"/> My tuition and books were paid for.</p> <p><input type="checkbox"/> I had an opportunity to get help with classes I knew would be tough for me.</p> <p><input type="checkbox"/> The classes were offered at a convenient time.</p> <p><input type="checkbox"/> The classes were offered at a convenient location.</p> <p><input type="checkbox"/> Other (please specify)</p> <div></div>
<p>* 3. If you completed high school or a GED in this country, how long has it been since you've been in a formal school setting? Check one.</p> <p><input type="radio"/> Less than 6 years ago</p> <p><input type="radio"/> Between 7-26 years</p> <p><input type="radio"/> Between 27-46 years</p> <p><input type="radio"/> More than 47 years</p> <p><input type="radio"/> I did not complete high school in this country.</p>

* 4. What are your future career goals? Check all that apply.

- ☐ Full time work
- ☐ Part time work
- ☐ Work in manufacturing
- ☐ Work in a different area (please specify):

* 5. What are your future educational goals? Check your highest degree desired.

- ☐ Long term certificate or diploma (at least one year of full time study)
- ☐ Associate degree (at least two years of full time study)
- ☐ Bachelor's degree (at least four years of full time study)
- ☐ Advanced degree (Master's or Doctoral degree)
- ☐ No further plans for studying

6. If you identified further education as a goal, in what area would you like to study? Please be as specific as possible.

* 7. Did you complete the entire 9 credits certificate? Check one.

- ☐ Yes
- ☐ No

Manufacturing Essentials - Student Experience**3. Skills for Work**

* 8. If your interest was to work in manufacturing, were you able to find a job related to the area of manufacturing after completing the certificate program? Check one.

- ☐ Yes I was able to find a job in manufacturing
- ☐ No I was not able to find a job in manufacturing
- ☐ I did not have an interest in working in manufacturing once I completed the certificate.

* 9. How do think the certificate has helped you find employment in the area of manufacturing? Check all that apply.

- ☐ It helped me network with employers through job fairs and employer visits.
- ☐ It helped me work on my communication skills.
- ☐ I had been out of work for a while and needed to refresh my technical skills so I could successfully get employed.
- ☐ It provided training in an area that had jobs.
- ☐ Not applicable
- ☐ Other (please specify)

* 10. Which skills do you feel you learned while in the certificate program? Check all that apply.

- ☐ Safety practices
- ☐ How to use tools such as lathes, power saws, and drill presses
- ☐ How to read blue prints and technical documents
- ☐ How to operate gas metal arc welding equipment and make welds according to code
- ☐ Manufacturing processes and practices
- ☐ Math skills to work with materials, tools, documents
- ☐ How to communicate better
- ☐ Other (please specify)

* 11. Which skills do you wish you would have learned or learned better? Check all that apply.

- ☐ Safety practices
- ☐ How to use tools such as lathes, power saws, and drill presses
- ☐ How to read blue prints and technical documents
- ☐ How to operate gas metal arc welding equipment and make welds according to code
- ☐ Manufacturing processes and practices
- ☐ Math skills to work with materials, tools, documents
- ☐ How to communicate better
- ☐ Other (please specify)

* 12. How helpful were your MANUFACTURING instructors in helping you learn these skills? These instructors taught courses such as Interpreting Engineering Drawings, Introduction to Gas Metal Arc Welding, Machining Basics, and Foundations in Manufacturing. Check one.

- ☐ Very helpful
- ☐ Moderately helpful
- ☐ Slightly helpful
- ☐ Not at all helpful
- ☐ No opinion

* 13. How helpful were your BRIDGE instructors in providing the additional support you needed to successfully complete the certificate? These instructors taught courses such as Student Success, with a focus on communications and math. Check one.

- ☐ Very helpful
- ☐ Moderately helpful
- ☐ Slightly helpful
- ☐ Not at all helpful
- ☐ No opinion

* 14. How well did the certificate program prepare you to be timely, attend your classes as required, and work hard? Check one.

- ☐ Very well
- ☐ Well
- ☐ Moderately well
- ☐ Not well at all
- ☐ Not sure

Manufacturing Essentials - Student Experience**4. Your School Experience**

* 15. What kind of expectations did your instructors have for your success in the certificate program? Check one.

- ☐ Very high expectations
- ☐ High expectations
- ☐ Moderate expectations
- ☐ Low expectations
- ☐ No expectations
- ☐ Not sure

* 16. While you were taking the Manufacturing Essentials Certificate program, did you? Check all that apply.

- ☐ Work part time
- ☐ Work full time
- ☐ Care for a child(ren)
- ☐ Care for a spouse or parent
- ☐ Visit a food pantry
- ☐ Receive benefits like food share/foodstamps or BadgerCare
- ☐ Experience homelessness
- ☐ Experience health issues personally or someone in your immediate family
- ☐ Experience challenges with transportation
- ☐ Experience a job loss
- ☐ None of the above
- ☐ Other (please specify)

* 17. While you were in the Manufacturing Essentials Certificate program and ***outside of class time***, did you? Check all that apply.

- ☐ Study at the library
- ☐ Study with a tutor
- ☐ Study with an instructor
- ☐ Study with your classmates
- ☐ Volunteer with the Student Life Office
- ☐ Participate in any Student Life events on campus
- ☐ Work on campus as student help or workstudy
- ☐ Participate in a mentoring program
- ☐ None of the above

* 18. What did you find ***most difficult*** about this program? Check all that apply.

- ☐ Time of the day when classes were offered
- ☐ Location of classes/location not accessible
- ☐ The intensity of the class schedule
- ☐ The rigor of the work
- ☐ Other (please specify)

* 19. What did you ***enjoy the most about this program?*** Check all that apply.

- ☐ The location of classes
- ☐ The class schedule
- ☐ The challenging nature of the work
- ☐ The instructors
- ☐ The staff
- ☐ The ability to connect with employers
- ☐ Being in school
- ☐ Meeting new people
- ☐ Learning new skills
- ☐ Other (please specify)

Manufacturing Essentials - Student Experience

5. Employment Status Prior to Certificate

* 20. Were you employed **prior** to entering the manufacturing essentials program? Check one.

- ☐ Yes, part-time in manufacturing
- ☐ Yes, part-time in a different area (please note area below)
- ☐ Yes, full-time in manufacturing
- ☐ Yes, full-time in a different area (please note below)
- ☐ No, I was not employed prior to the certificate program, skip to question

I worked in another area OTHER than manufacturing (please specify):

21. If you were employed **prior** to the manufacturing essentials program, did you stay with the **same employer after completing** the certificate? Check one.

- ☐ Yes
- ☐ No

Manufacturing Essentials - Student Experience

6. Employment

22. With your **same employer**, how was your rate of pay per hour or employment status affected by completing the program? Check the option that **most closely** describes your situation.

- ☐ No change in rate of pay per hour or job; I am earning the same per hour and my job is the same
- ☐ No change in job or rate of pay per hour; but I went from part-time to full-time employment, thereby raising my overall wages
- ☐ No changes in rate of pay per hour; but, I moved from one area to another
- ☐ A significant raise in rate of pay per hour (more than \$1 per hour) in same job
- ☐ A moderate raise in rate of pay per hour (between \$0.50 and \$0.99 per hour) in same job
- ☐ A slight raise in rate of pay per hour (\$0.05-\$0.49 per hour) in same job
- ☐ I was promoted to a different job with a significant raise in rate of pay per hour (more than \$1 per hour)
- ☐ I was promoted to a different job with a moderate raise in rate of pay per hour (between \$0.50 and \$0.99 per hour)
- ☐ I was promoted to a different job with a slight raise in rate of pay per hour (\$0.05-\$0.49 per hour)

23. If you now have a **different employer**, how was your rate of pay per hour or employment affected by completing the program? Check one.

- ☐ A significant raise in rate of pay per hour (more than \$1 per hour) in a different job with a different employer
- ☐ A moderate raise in rate of pay per hour (between \$0.50 and \$.99 per hour) in a different job with a different employer
- ☐ A slight raise in rate of pay per hour (\$0.05-\$0.49 per hour) in a different job with a different employer

Manufacturing Essentials - Student Experience

7. About You

* 24. Tuition fees and books for this certificate were paid on your behalf through the support of a grant. Had you not been provided this financial support, would you still have chosen and completed this program? Check one.

- ☐ Yes
- ☐ No
- ☐ I don't know

* 25. What most accurately describes your racial/ethnic group? Check all that apply.

- ☐ White
- ☐ Black/African American
- ☐ American Indian/Alaskan Native
- ☐ Asian
- ☐ Hawaiian/Pacific Islander
- ☐ Hispanic/Latino
- ☐ Other (please specify)

* 26. If you were educated in this country, what most accurately describes your highest level of education **prior** to entering the manufacturing essentials certificate? Check one.

- ☐ I was not educated in this country
- ☐ High school graduate (or equivalent)
- ☐ Some college, no degree
- ☐ Associate's degree
- ☐ Bachelor's degree
- ☐ Master's degree
- ☐ Professional school degree (MD, DDC, JD, etc.)
- ☐ Doctorate degree

* 27. If you were educated in a **different** country, what is the highest level of education you received in your native country? Check one.

- ☐ Not Applicable, I was educated in the United States
- ☐ Primary School
- ☐ Secondary School
- ☐ Technical or Vocational School
- ☐ Bachelor's degree
- ☐ Master's degree
- ☐ Professional or Specialist degree
- ☐ Doctorate degree

* 28. Which language is primarily used in your home? Check one.

- ☐ English
- ☐ Spanish
- ☐ Hmong
- ☐ French
- ☐ Other (please specify)

* 29. If you had **no constraints** (finances, responsibilities, work, etc.), what career area would you choose to study? Please be specific.

30. If you had been out of school for a while or had not previously attended college, how helpful was this certificate in boosting your confidence that you could successfully complete college-level work? Check one.

- ☐ Very helpful
- ☐ Moderately helpful
- ☐ Slightly helpful
- ☐ Not at all helpful
- ☐ No opinion

* 31. Have you since continued on for additional education? Check one.

☐ Yes

☐ No

32. If you indicated you have not continued on for education, why not? Check all that apply.

☐ I work full-time.

☐ I work part-time.

☐ I receive additional training at work that is most relevant to my job.

☐ I am not interested.

☐ I have too many family demands on my time.

☐ I don't have the money.

☐ I don't know what I want to study.

☐ Other (please specify)

Manufacturing Essentials - Student Experience

8. Continuing Your Education

33. If you answered yes to continuing your education, what school of higher learning have you or are you currently attending? Please be specific.

34. What credential are you enrolled in at any of the schools listed in the previous question? Check one.

- ☐ Technical Diploma
- ☐ Associate's Degree
- ☐ Bachelor's degree
- ☐ Master's degree
- ☐ Professional or Specialist degree
- ☐ Doctorate degree
- ☐ Other (please specify)


35. Have you **completed** any of these credentials since you completed the manufacturing essentials certificate? Check all that apply.

- ☐ Technical Diploma
- ☐ Associate's Degree
- ☐ Bachelor's degree
- ☐ Master's degree
- ☐ Professional or Specialist degree
- ☐ Doctorate degree
- ☐ Other (please specify)

Manufacturing Essentials - Student Experience**9. Final Thoughts**

36. Is there anything about this program or the College that you would like to share?

37. Please provide your mailing address if you'd like for me to mail you your \$10 Starbucks gift card. Otherwise, please stop in to room SM103 at the South Campus to pick up your card. The South Campus is located at 2238 South Park Street, Madison, WI, 53713.

Name	<input type="text"/>
Address	<input type="text"/>
City/Town	<input type="text"/>
State/Province	-- select state -- 
ZIP/Postal Code	<input type="text"/>
Email Address	<input type="text"/>
Phone Number	<input type="text"/>

APPENDIX C

FACULTY & STAFF SURVEY INSTRUMENT

Manufacturing Essentials Bridge Certificate - Faculty & Support Staff Experience
The Basics
<p>* 1. How is your day-to-day job classified at the college? Check one.</p> <p><input type="radio"/> Full-time instructor</p> <p><input type="radio"/> Part-time instructor</p> <p><input type="radio"/> Full-time PSRP (support staff)</p> <p><input type="radio"/> Part-time PSRP (support staff)</p> <p><input type="radio"/> Grant-funded or Limited Term instructor</p> <p><input type="radio"/> Grant-funded or Limited Term PSRP</p> <p><input type="radio"/> Other (please specify)</p> <div></div>
<p>* 2. How did you participate in the Manufacturing Essentials Bridge Certificate? Check one.</p> <p><input type="radio"/> Full-time instructor</p> <p><input type="radio"/> Part-time instructor</p> <p><input type="radio"/> Full-time PSRP (support staff)</p> <p><input type="radio"/> Part-time PSRP (support staff)</p> <p><input type="radio"/> Grant-funded or Limited Term instructor</p> <p><input type="radio"/> Grant-funded or Limited Term PSRP</p> <p><input type="radio"/> Other (please specify)</p> <div></div>

* 3. What was your **role** in the work of the certificate? Check all that apply.

- ☐ Teach the non-credit classes
- ☐ Teach the occupational/technical education classes
- ☐ Recruit students
- ☐ Advise students
- ☐ Develop data instruments and ensure data collection
- ☐ Case-manage students
- ☐ Other (please specify)

* 4. Did this work or your role with this offering differ significantly from the work you do in your day-to-day work for the college? Check one.

- ☐ Yes
- ☐ No
- ☐ Not sure

Manufacturing Essentials Bridge Certificate - Faculty & Support Staff Experience**The Work**

5. If this work differed from the work you normally carry out at the college, do you feel you were appropriately compensated for the additional/different type of work? Check one.

- ☐ Yes, I was appropriately compensated for all my work
- ☐ No, I was not appropriately compensated for all my work
- ☐ Not sure

6. If this work differed from the work you normally carry out at the college, did you receive special training or engage in professional development to better prepare for this type of work? Check one.

- ☐ Yes, I received special training or professional development.
- ☐ No, I did not receive training or professional development.

7. If you indicated you had received special training or professional development to carry out this work, what kind of activities did you participate in? Check all that apply.

- ☐ Attended a conference
- ☐ Participated in a workshop
- ☐ Participated in a webinar
- ☐ Participated in a special training provided by a governmental agency (such as the Dept. of Labor, Workforce Development Board, etc.)
- ☐ Completed a course
- ☐ Other (please specify)

8. Would you do this type of bridge work again? Check the most appropriate response:

- ☐ Yes, with no reservations.
- ☐ Yes, with some reservations.
- ☐ No

9. If you would do this work again with some reservations, what would those reservations be? Please be specific.

Manufacturing Essentials Bridge Certificate - Faculty & Support Staff Experience

Model/Program Development

10. Did you assist in developing any component of the Manufacturing Essentials Bridge Certificate program? Check one.

- ☐ Yes
☐ No

11. If you responded you assisted in developing the certificate, what was your role in developing it? Check all that apply.

- ☐ Help write the TAACCT grant
☐ Develop or adapt the curriculum for the developmental support classes
☐ Develop or adapt the curriculum for the occupational/technical education classes
☐ Collaborate with industry/ employers to ensure their needs were represented in program development
☐ Aligning college processes for enrollment, placement testing, etc., to support the work
☐ Identify or align or collaborate with other areas to collect, summarize, and report data
☐ Other (please specify)

12. Did you assist in developing the **employment component** of this program, including the following? Check all that apply.

- ☐ Yes, I recruited businesses to participate in advisory group
☐ Yes, I arranged for student tours
☐ Yes, I arranged for student internship, coop, or other work-like experience
☐ Yes, I assessed employers' skills needs based on identified gaps
☐ No, I did not assist in the employment component
☐ Other (please specify)

13. If you indicated you assisted with the employer component, how did you solicit the employer's needs/feedback/interests? Check all that apply.

- ☐ Surveyed employer
- ☐ Employer participated in a focus group
- ☐ Employer helped develop curriculum
- ☐ Employer is member of a program advisory committee
- ☐ Other (please specify)

Manufacturing Essentials Bridge Certificate - Faculty & Support Staff Experience**Administration & Implementation Experience**

* 14. Did you feel supported by your administrators/supervisors to carry out this work? Check one.

- ☐ I felt very supported
- ☐ I felt supported
- ☐ I felt somewhat supported
- ☐ I did not feel supported
- ☐ I don't know

* 15. As a bridge offering, there was a partnership between several areas to plan and implement this work. Which answer best describes the area you work in? Check one.

- ☐ Technical Education
- ☐ Developmental Education
- ☐ Enrollment Support Services
- ☐ Student Development and Retention (Advising)
- ☐ Institutional Learning & Effectiveness (Grants Office)
- ☐ Other (please specify)

* 16. As a bridge offering, there was a partnership between the technical department and the developmental department to develop and implement an appropriate curriculum. How easy was the partnering area to work with? Check one.

- ☐ The partnering area was very easy to work with.
- ☐ The partnering area was easy to work with.
- ☐ The partnering area was somewhat easy to work with.
- ☐ The partnering area was not easy to work with.
- ☐ Not sure.

17. If you indicated that the partnering area(s) was ***not easy to work with***, what were some of the ***challenges*** to your cooperation? Please be as specific as possible.

Challenge 1 please be as
specific as possible

Challenge 2 please be as
specific as possible

Challenge 3 please be as
specific as possible

18. If you indicated that the partnering area(s) was ***easy to work with***, what ***enhanced*** your cooperation?
Please be as specific as possible.

Enhancement 1 please be
as specific as possible

Enhancement 2 please be
as specific as possible

Enhancement 3 please be
as specific as possible

Manufacturing Essentials Bridge Certificate - Faculty & Support Staff Experience

Learning

* 19. In your opinion, were the manufacturing essentials bridge students able to complete the required college-level work? Check one.

- ☐ The bridge students were **very capable** of doing college-level work.
- ☐ The bridge students were **capable** of doing college-level work.
- ☐ The bridge students were **somewhat capable** of doing college level work.
- ☐ The bridge students were **not at all capable** of doing college level work.
- ☐ I am not sure.

20. If you indicated that bridge students were capable or very capable of doing college-level work, what helped contribute to that capability? Check all that apply.

- ☐ Support class instruction
- ☐ Innate ability
- ☐ Interest in the career area
- ☐ Modified curriculum
- ☐ Case management
- ☐ Low-risk environment (i.e., tuition is paid for, additional instructional support)
- ☐ Cohort-based model
- ☐ Previous higher education experience
- ☐ Other (please specify)

21. If you indicated that students were somewhat or not capable of doing college-level work, what might have helped these students be more successful? Check all that apply.

- ☐ Additional support class instruction.
- ☐ Additional case management.
- ☐ Extended classroom time.
- ☐ More one-on-one time with instructor.
- ☐ More frequent assessments.
- ☐ More applied work.
- ☐ Other (please specify)

22. Did you and your students have the necessary instructional support materials needed to perform well academically? Check one.

- ☐ Yes
- ☐ No
- ☐ Not sure

Manufacturing Essentials Bridge Certificate - Faculty & Support Staff Experience

Student Experience

* 23. One of the rationales for developing short-term certificates is that they immediately prepare people for work. In your opinion, did this program prepare people for entry-level work in the manufacturing industry? Check one.

- ☐ Yes, students are well prepared for entry-level work
- ☐ No, students are not well prepared for entry-level work
- ☐ Not sure

* 24. Another rationale for developing short-term certificates is that they expose students to a structured career pathway so they have a better awareness of potential career trajectories in the technical education area. In your role, did you generally see an increased awareness of career opportunities in manufacturing? Check one.

- ☐ The certificate **helped students become very aware** of career trajectories in manufacturing.
- ☐ The certificate **helped students become aware** of career trajectories in manufacturing.
- ☐ The certificate **helped students become somewhat aware** of career trajectories in manufacturing.
- ☐ The certificate **did not help students become aware** of career trajectories in manufacturing.
- ☐ Not sure.

* 25. Another reason for creating short-term bridge certificates is that they increase a student's confidence in their ability to do college-level work. What was your experience? Check one.

- ☐ Students **became more confident** in their ability to do college-level work.
- ☐ Students **became confident** in their ability to do college-level work.
- ☐ Students **became somewhat confident** in their ability to do college-level work.
- ☐ Students **did not become confident** in their ability to do college-level work.
- ☐ Not sure.

* 26. How **effective** do you think this model was in helping students who may have historically had a negative experience in school or never had a post-secondary experience in this country, feel more welcomed into the college environment? Check one.

- ☐ Programming model was **very effective** in helping students feel welcome to the college.
- ☐ Programming model was **effective** in helping students feel welcome to the college.
- ☐ Programming model was **somewhat effective** in helping students feel welcome to the college.
- ☐ Programming model was **not effective** in helping students feel welcome to the college.
- ☐ Not sure.

27. Is there anything else you would like to share about your experience working with bridge programming or the manufacturing essentials certificate program? Please be specific.

28. As a token of appreciation for completing this survey, I would like to provide you with a \$10 Starbucks gift card. Please provide me with your campus mailing address and I will send it to you. Thank you!

Name

Campus

APPENDIX D
ADMINISTRATOR SURVEY
INSTRUMENT

Manufacturing Essentials Bridge Certificate Program - the Administrator's Experience

About Your Work

* 1. Historically, an important focus of two-year schools has been to provide access to higher education. There is increasing pressure to broaden the focus to credential completion. What do you think will be the greatest challenges in your area as you seek to improve completion rates? Please be as specific as possible.

Challenge 1

Challenge 2

Challenge 3

* 2. Traditionally, industry involvement in instructional programming has been through membership on a program advisory committee. With the emphasis on addressing the skills gaps to better meet employer needs, have your industry partners taken a more active role in developing, modifying, or adapting your instructional programming? Check one.

☐

Yes

☐

No

☐

I am not sure.

☐

Not applicable.

* 3. Madison College recently participated in the multi-recipient grant *Making the Future*, which focused on developing career pathways in the area of advanced manufacturing. Consequently, the short-term manufacturing essentials certificate was developed and then subsequently offered as a bridge program. If you were involved in this effort, what was your interest in developing a short-term certificate bridging adult basic education to credit-based programming? Check all that apply.

- ☐ Address industry needs
- ☐ Develop a career pathway in manufacturing
- ☐ Increase enrollments in technical program
- ☐ Diversify technical program
- ☐ Address needs of low-income, low-skill adults
- ☐ Create sector strategies to support economic development
- ☐ Not applicable or not involved
- ☐ Other (please specify)

* 4. What was your role in working with this grant or programming? Check all that apply.

- ☐ Wrote portion of grant
- ☐ Developed or adapted curriculum that was included in the programming
- ☐ Developed data collection instruments
- ☐ Collected data
- ☐ Supervised full time faculty
- ☐ Supervised part time faculty
- ☐ Supervised support staff
- ☐ Monitored grant implementation
- ☐ Monitored and reported on grant progress
- ☐ Developed marketing plan
- ☐ Developed recruitment plan
- ☐ Attended grant activities
- ☐ Collaborated with other areas in the college to develop bridge programming model
- ☐ Other (please specify)

5. In general, how supportive of the work were the faculty and staff involved with carrying out the bridge programming? Check one.

- ☐ Very supportive
- ☐ Supportive
- ☐ Neutral
- ☐ Opposed
- ☐ Very opposed
- ☐ I don't know.
- ☐ Not applicable

* 6. Bridge programming recruits students from populations that are predominantly disadvantaged, less skilled, or minority. How have your **faculty** prepared to teach this population of students? Check all that apply.

- ☐ Participated in diversity training offered through the college
- ☐ Participated in diversity training offered through a community organization
- ☐ Participated in pedagogical training offered through the college
- ☐ Participated in pedagogical training offered through another entity
- ☐ Participated in a conference or training specifically on bridge programming
- ☐ Had previous meaningful experience with this population
- ☐ Received no training
- ☐ I don't know.
- ☐ Not applicable

Manufacturing Essentials Bridge Certificate Program - the Administrator's Experience**Bridge Programming**

7. Prior to this work, did you have experience with running either a bridge program or other mainstreaming type of programming that called for an interdisciplinary approach beyond your current area of responsibility? Check one.

- ☐ Yes
- ☐ No
- ☐ I don't know.
- ☐ Not applicable

8. To what extent, if any, did you experience a shortage in resources for the development and implementation of the manufacturing bridge essentials certificate as a grant-funded initiative? Check one.

- ☐ I always experienced a shortage of resources
- ☐ I almost always experienced a shortage of resources
- ☐ I occasionally experienced a shortage of resources
- ☐ I never experienced a shortage of resources
- ☐ I am not sure.
- ☐ Not applicable

Manufacturing Essentials Bridge Certificate Program - the Administrator's Experience

9. If you indicated you experienced some level of resource shortage, what resources were you lacking?
Check all that apply.

- ☐ Qualified instructors
- ☐ Funding to pay for instructors' salaries and benefits
- ☐ Funding to pay for curriculum development
- ☐ Funding to pay for support staff's salaries and benefits
- ☐ Funding to pay for new instructional equipment
- ☐ Funding to pay for new tools or software to support the grant or instruction
- ☐ Physical space to offer the training
- ☐ Expertise or know-how on data collection and reporting
- ☐ Access to timely information and communication
- ☐ Not applicable
- ☐ Other (please specify)

Manufacturing Essentials Bridge Certificate Program - the Administrator's Experience

* 10. If this effort had not been grant-funded, how likely is it that this type of programming, given your current allocation of resources and holding all other factors constant, could have been developed and offered?

Check one.

- ☐ Very likely
- ☐ Likely
- ☐ Somewhat likely
- ☐ Not likely
- ☐ I don't know.
- ☐ Not applicable

Manufacturing Essentials Bridge Certificate Program - the Administrator's Experience

Building Partnerships

11. This work was supported by a multi-year grant from the federal government. A grant goal was to foster relationships and collaborations among the different partners involved in addressing worker skill gaps. To what extent have your expectations been met to develop relationships with key industry partners in meeting this goal? Check one.

- ☐ My ability to develop a relationship with key industry partners has been far above my expectations
- ☐ My ability to develop a relationship with key industry partners has been above my expectations
- ☐ My ability to develop a relationship with key industry partners has met my expectations
- ☐ My ability to develop a relationship with key industry partners has been slightly below my expectations
- ☐ My ability to develop a relationship with key industry partners has not met my expectations
- ☐ I am not sure.
- ☐ Not applicable

* 12. If you worked with industry partners on any aspect of the grant, how were these partners identified? Check all that apply.

- ☐ Program Advisory Committee Member
- ☐ Former colleague or acquaintance
- ☐ Wisconsin Manufacturers & Commerce recommendation
- ☐ South Central Wisconsin Workforce Development Board recommendation
- ☐ State of Wisconsin Department of Workforce Development recommendation
- ☐ Community Based Organization recommendation
- ☐ Wisconsin Technical College System recommendation
- ☐ Other Madison College connection (Foundation, President's Council, etc.)
- ☐ I don't know.
- ☐ Not applicable
- ☐ Other (please specify)

Manufacturing Essentials Bridge Certificate Program - the Administrator's Experience

13. How supportive did you find your industry partners of the manufacturing essentials bridge program certificate? Check one.

- ☐ The industry partner was very supportive of the credential
- ☐ The industry partner was often supportive of the credential
- ☐ The industry partner was sometimes supportive of the credential
- ☐ The industry partner was seldom supportive of the credential
- ☐ The industry partner was never supportive of the credential
- ☐ I don't know.
- ☐ Not applicable

14. If you indicated the partner was supportive, how did the industry partner demonstrate support? Check all that apply.

- ☐ Hired graduates of the certificate
- ☐ Allowed current employees to participate in the training
- ☐ Assigned staff to serve on advisory team to develop or improve curriculum
- ☐ Aligned or developed career pathways within their business to promote current employees and new hires
- ☐ Opened business for tours of space
- ☐ Opened business for student shadowing or internship experiences
- ☐ Guest lectured in class about work expectations, experience, general field
- ☐ Opened business for faculty externships or training
- ☐ Donated equipment to training
- ☐ Donated financially to training
- ☐ I don't know.
- ☐ Not applicable
- ☐ Other (please specify)

Manufacturing Essentials Bridge Certificate Program - the Administrator's Experience**Employer Needs**

* 15. What is your level of agreement with the following statement: "I understand employers' needs for a skilled workforce." Check one.

- ☐ Strongly agree
- ☐ Agree
- ☐ Undecided
- ☐ Disagree
- ☐ Strongly disagree
- ☐ Not applicable

16. In your opinion, how well did the manufacturing essentials certificate meet the needs of employers for entry-level workers? Check one.

- ☐ The certificate met the needs of employers for entry level workers very well
- ☐ The certificate met the needs of employers for entry level workers well
- ☐ The certificate met the needs of employers for entry level workers somewhat well
- ☐ The certificate did not meet the needs of employers for entry level workers
- ☐ I don't know.
- ☐ Not applicable

* 17. In general, how well do you feel your area is able to respond to employers' needs for skilled, trained workers? Check one.

- ☐ My area is able to respond very well to employers' needs
- ☐ My area is able to respond reasonably well to employers' needs
- ☐ My area is able to respond somewhat well to employers' needs
- ☐ My area is not able to respond to employers' needs
- ☐ I don't know.
- ☐ Not applicable

Manufacturing Essentials Bridge Certificate Program - the Administrator's Experience**Support for Career Pathways**

These next questions deal with internal and external supports and demands related to career pathways work.

18. How supported did you feel from your immediate supervisor to engage in this type of work? Check one.

- ☐ I was very supported
- ☐ I was supported
- ☐ I was somewhat supported
- ☐ I was not supported at all
- ☐ I don't know.
- ☐ Not applicable

19. How supported did you feel from the Wisconsin State Technical System (WTCS) to engage in this type of work? Check one.

- ☐ WTCS was very supportive
- ☐ WTCS was supportive
- ☐ WTCS was somewhat supportive
- ☐ WTCS was not supportive at all
- ☐ I don't know.
- ☐ Not applicable

20. How supported did you feel from the Wisconsin legislature to engage in this type of work? Check one.

- ☐ The legislature was very supportive
- ☐ The legislature was supportive
- ☐ The legislature was somewhat supportive
- ☐ The legislature was not supportive
- ☐ I don't know.
- ☐ Not applicable

Manufacturing Essentials Bridge Certificate Program - the Administrator's Experience

21. In your opinion, how far have we come in aligning our work at these varying levels to achieve greater success in meeting the skills gap for a better prepared workforce? Check one.

- ☐ We are well on our way to aligning our work at these different levels
- ☐ We are on our way to aligning our work at these different levels
- ☐ We are somewhat on our way to aligning our work at these different levels
- ☐ We have a long way to go to aligning our work at these different levels
- ☐ I don't know.
- ☐ Not applicable

* 22. Embedded credentials are a component of career pathways. What is the most significant **opportunity** for your area in building these pathways? Please be specific.

* 23. What is the most significant **challenge** for your area in building these pathways? Please be specific.

* 24. Bridge programming is a current measure on the state's performance based funding formula (PBF). In general, how much does PBF influence your **day-to-day work** as an administrator? Check one.

- ☐ It always guides my work
- ☐ It guides my work
- ☐ It somewhat guides my work
- ☐ It does not guide my work at all
- ☐ I don't know.
- ☐ Not applicable

25. Strengthened industry alliances help create sector sustainability and increase industry competitiveness. In your opinion, how can the College help **industry** work together to create these sector-level strategies to developing the workforce and enhance their competitiveness? Please be specific.

26. Lastly, is there anything you would like to add regarding bridge programming, guided pathways, or performance based funding?

27. To claim your \$10 Starbucks gift card, please provide me with your mailing address. Thanks again, Tina

Name

Address or Campus

Email Address

Phone Number

APPENDIX E

“KEY FACTS” EDUCATION AT A GLANCE 2012: OECD INDICATORS

UNITED STATES – Country Note – *Education at a Glance 2012: OECD Indicators*

KEY FACTS

Indicator	United States	OECD average	United States rank*
Educational Access and Output			
Enrolment rates			
3-year-olds (in early childhood education)	51%	66%	25 of 36 countries
4-year-olds (in early childhood and primary education)	69%	81%	28 of 38 countries
5-14 year-olds (all levels)	97%	96%	29 of 39 countries
Percentage of population that has attained pre-primary or primary levels of education only			
25-64 year-olds	4%	m	24 of 37 countries
Percentage of population that has attained at least upper secondary education			
25-64 year-olds	89%	74%	4 of 40 countries
25-34 year-olds	88%	82%	11 of 36 countries
55-64 year-olds	90%	62%	1 of 36 countries
Percentage of population that has attained tertiary education			
25-64 year-olds	42%	31%	5 of 41 countries
25-34 year-olds	42%	38%	14 of 37 countries
55-64 year-olds	41%	23%	4 of 37 countries
Entry rates into tertiary education			
Vocational programmes (Tertiary-type B)	m	17%	m
University programmes (Tertiary-type A)	74%	62%	9 of 36 countries
Graduation rates			
Percentage of today's young people expected to complete upper secondary education in their lifetime	77%	84%	22 of 27 countries
Percentage of today's young people expected to complete university education (tertiary-type A) in their lifetime	38%	39%	14 of 28 countries
Economic and Labour Market Outcomes			
Unemployment rate of 25-64 year-olds			
Below upper secondary	16.8%	12.5%	7 of 33 countries
Upper secondary and post-secondary non-tertiary	11.2%	7.6%	7 of 34 countries
Tertiary	5.3%	4.7%	10 of 34 countries
Average earnings premium for 25-64 year-olds with tertiary education (compared to people with upper secondary education; upper secondary = 100)			
Men and women	177	155	6 of 32 countries
Men	184	160	7 of 32 countries
Women	175	157	6 of 32 countries
Average earnings penalty for 25-64 year-olds who have not attained upper secondary education (compared to people with upper secondary education; upper secondary = 100)			
Men and women	66	77	31 of 32 countries
Men	64	78	31 of 32 countries
Women	61	74	30 of 32 countries

UNITED STATES – Country Note – Education at a Glance 2012: OECD Indicators

Indicator	United States	OECD average	United States rank *
Percentage of people not in employment, education or training			
15-29 year-olds (2005 data)	13.1%	15.0%	16 of 32 countries
15-29 year-olds (2010 data)	16.1%	15.8%	14 of 32 countries
Financial Investment in Education			
Annual expenditure per student (in equivalent USD, using PPPs)			
Pre-primary education	8 396	6 670	6 of 34 countries
Primary education	11 109	7 719	4 of 35 countries
Secondary education	12 550	9 312	5 of 37 countries
Tertiary education	29 201	13 728	1 of 37 countries
Total public and private expenditure on education			
As a percentage of GDP	7.3%	6.2%	5 of 37 countries
Total public expenditure on education			
As a percentage of total public expenditure	13.1%	13.0%	15 of 32 countries
Share of private expenditure on educational institutions			
Primary, secondary and post-secondary non-tertiary education	7.9%	8.8%	16 of 32 countries
Tertiary education	61.9%	30%	5 of 31 countries
All levels of education	28%	16%	5 of 30 countries
Schools and Teachers			
Ratio of students to teaching staff			
Pre-primary education	14.6	14.4	17 of 32 countries
Primary education	14.5	15.8	24 of 36 countries
Secondary education	14.4	13.8	14 of 38 countries
Number of hours of compulsory instruction time per year			
7-8 year-olds	m	774 hours	m
9-11 year-olds	m	821 hours	m
12-14 year-olds	m	899 hours	m
Number of hours of teaching time per year (for teachers in public institutions)			
Primary education	1 097	782 hours	1 of 35 countries
Lower secondary education	1 068	704 hours	3 of 34 countries
Upper secondary education	1 051	658 hours	3 of 35 countries
Ratio of teachers' salaries to earnings for full-time, full-year adult workers with tertiary education			
Primary school teachers	0.67	0.82	19 of 27 countries
Lower secondary school teachers	0.69	0.85	19 of 27 countries
Upper secondary school teachers	0.72	0.90	19 of 27 countries

* Countries are ranked in descending order of values.

See: Education at a Glance 2012: OECD Indicators

Visit: www.oecd.org/edu/eag2012

Country note author: J.D. LaROCK (E-mail contact: dirk.vandamme@oecd.org)

APPENDIX F

IRB APPROVAL

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
1138 Pearson Hall
Ames, Iowa 50011-2307
515-294-4366
FAX 515-294-4207

Date: 1/26/2016

To: Valentina Ahedo
4614 Judy Lane
Madison, WI 53704

CC: Dr. Alex Tuckness
529 Ross
Dr. Kelly Shaw
527 Ross Hall

From: Office for Responsible Research

Title: Bridging the Skills Gap and the Rise of the Short-Term Certificate: A Case Study

IRB ID: 16-009

Study Review Date: 1/25/2016

The project referenced above has been declared exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b) because it meets the following federal requirements for exemption:

- (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey or interview procedures with adults or observation of public behavior where
 - Information obtained is recorded in such a manner that human subjects cannot be identified directly or through identifiers linked to the subjects; or
 - Any disclosure of the human subjects' responses outside the research could not reasonably place the subject at risk of criminal or civil liability or be damaging to their financial standing, employability, or reputation.

The determination of exemption means that:

- **You do not need to submit an application for annual continuing review.**
- **You must carry out the research as described in the IRB application.** Review by IRB staff is required prior to implementing modifications that may change the exempt status of the research. In general, review is required for any modifications to the research procedures (e.g., method of data collection, nature or scope of information to be collected, changes in confidentiality measures, etc.), modifications that result in the inclusion of participants from vulnerable populations, and/or any change that may increase the risk or discomfort to participants. Changes to key personnel must also be approved. The purpose of review is to determine if the project still meets the federal criteria for exemption.

Non-exempt research is subject to many regulatory requirements that must be addressed prior to implementation of the study. Conducting non-exempt research without IRB review and approval may constitute non-compliance with federal regulations and/or academic misconduct according to ISU policy.

Detailed information about requirements for submission of modifications can be found on the Exempt Study Modification Form. A Personnel Change Form may be submitted when the only modification involves changes in study staff. If it is determined that exemption is no longer warranted, then an Application for Approval of Research Involving Humans Form will need to be submitted and approved before proceeding with data collection.

Please note that you must submit all research involving human participants for review. **Only the IRB or designees may make the determination of exemption**, even if you conduct a study in the future that is exactly like this study.

Please be aware that **approval from other entities may also be needed**. For example, access to data from private records (e.g. student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. **An IRB determination of exemption in no way implies or guarantees that permission from these other entities will be granted.**

Please don't hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu.